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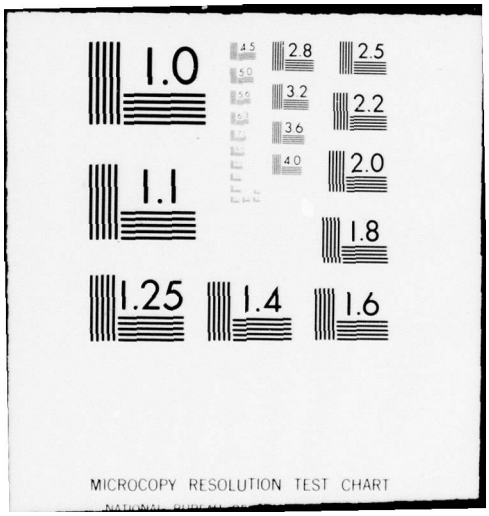
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STUDY REPORT
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FIRST TERM REENLISTMENT PROJECTION BY MILITARY OCCUPATIONAL SPECIALTY (1-RPM)

APRIL 1979

PREPARED BY

METHODOLOGY, RESOURCES AND COMPUTATION DIRECTORATE

US ARMY CONCEPTS ANALYSIS AGENCY

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CAA-SR-79-5

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Reenlistment behavior of first term soldiers impacts directly the Army's ability to maintain an effective force with necessary skills. The 1-RPM study addresses influences within the reenlistment environment and integrates these factors into reenlistment projections at the Military Occupational Specialty (MOS) level. The report includes six chapters, supported by Appendices. Chapter 1 provides introductory and background material. Chapter 2 addresses the methodology formulated to analyze the reenlistment environment. The analysis of historical data and policies is documented in Chapter 3. Chapter 4 presents the forecasting

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methodology and model validations. In Chapter 5, the effect of exogenous variables on reenlistments is discussed. The final chapter presents major observations.

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FIRST TERM REENLISTMENT PROJECTION BY MILITARY OCCUPATIONAL SPECIALTY (1-RPM)

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CAA-SR-79-5

DEPARTMENT OF THE ARMY
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IN REPLY REFER TO

MOCA-MRR 13 April 1979

SUBJECT: First Term Reenlistment Projection by Military Occupational Specialty (1-RPM)

Assistant Secretary of the Army
(Manpower and Reserve Affairs)
Washington, DC 20310

1. Reference: Letter, Office of the Assistant Secretary of the Army, dated 11 Jan 78, subject: Tasking Directive - First Term Reenlistment Projection by Military Occupational Specialty (1-RPM).

2. The US Army Concepts Analysis Agency (CAA) has conducted a study to analyze the reenlistment behavior of first term soldiers and developed a forecasting method that will assist personnel managers in focusing and applying accession and retention programs at the military occupational specialty (MOS) level. This work, reported in the attached document, has resulted in a quantitative reenlistment forecast methodology for application in the management of enlisted personnel. This report also provides insights and observations on the reenlistment and separation behavior of FY 73 and 74 accessions which may be useful to enlisted manpower managers.

3. The 1-RPM methodology for estimating the reenlistment behavior of first term soldiers by MOS is based on a multi-dimensional, demographic view and results in improved short-term personnel forecasts. A test which compares the 1-RPM forecasting model to currently used methods indicates a 50 to 60 percent reduction in projection error. Such improvements in estimating reenlistment behavior provides the Army a mechanism with which to manage its personnel resources better.

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MG, USA
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SUMMARY

1. PROBLEM. Army manpower managers concerned with planning for the enlisted force have been hampered by an inability to project accurately the rates at which soldiers reenlist in their military occupational specialties (MOS). Inaccurate projections are felt throughout the personnel community, to the Army's detriment, because budgets, training schools, recruiters, and force planners are influenced heavily by the projections they receive. An improved projection method would reduce the turbulence for manpower managers and make more efficient use of Army resources. Therefore, a need exists for a methodology which projects first term* reenlistments in a manner that improves the quantitative accuracy at both the Army and MOS level.

2. PURPOSE. The purpose of the First Term Reenlistment Projection by Military Occupational Specialty (1-RPM) Study is to develop and implement a methodology for projecting first term reenlistments in a manner that:

a. Improves the quantitative accuracy of reenlistment projections at the MOS level.

b. Provides an improved capability to formulate and assess policies designed to influence the flow of first term reenlistments.

3. BACKGROUND. As more and more sophisticated equipment is introduced into its inventory, the Army must carefully manage its manpower resources in order to maintain the quality and quantity of soldiers required to accomplish its mission.

a. The Army's enlisted force is divided into two broad categories: first term soldiers and career soldiers. First term soldiers are individuals who are serving in their initial enlistment, and career soldiers are those soldiers who have reenlisted at least once. Effective management of the Army's manpower resources requires that the first term soldiers be monitored and controlled

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*First term soldiers are those soldiers on their first enlistment, i.e., have not reenlisted.

from the accession point to the point that they enter the career force by reenlisting. The degree to which personnel managers can monitor, control, and predict the reenlistment behavior of the first term soldiers directly impacts how effectively the personnel and skill requirements for the career force are met.

b. Current reenlistment projection models provide managers with reenlistment projections at an aggregated or Army-wide level. These models are limited in their ability to incorporate the effects of changes in reenlistment patterns or personnel policies.

4. METHODOLOGY SYNOPSIS. The initial focus of the 1-RPM Study was an analysis of historical separation and reenlistment behavior to identify separation and reenlistment trends and patterns. The trends and patterns were then to be used in developing and implementing a reenlistment forecast methodology which models reenlistment behavior and also provides a capability for formulating and assessing first term reenlistment policies.

a. The data base provided and used in this study consisted of records for all Army nonprior service accessions during fiscal years (FY) 73 and 74. Demographic subpopulations were identified and used in predicting reenlistments. The demographic variables used to define the subpopulations were sex, race, pay grade, education and age. Using the initial expiration of term of service (ETS) date as a reference point, separation distributions, reenlistment rates and reenlistment distributions were calculated. The initial ETS date was computed for each record by adding the term of service entry to the accession date. The separation distributions provided information on when, relative to the ETS date, that the separation occurred (by Army definition: a reenlistment is a separation). Reenlistment rates were computed by dividing the number of reenlistments by the number of separations for the desired level of detail, i.e. by term of service (TOS), subpopulation, and ETS month. The reenlistment distributions established patterns of when a reenlistment occurred relative to a soldier's ETS date.

b. To forecast reenlistments for a point in time, a forecast methodology must first predict that a reenlistment will occur and then predict when the reenlistment will occur. The 1-RPM methodology takes into account that a relatively small proportion of reenlistments occur within one month of a soldier's initial ETS date. Therefore, to forecast reenlistments for a 12-month period, the reenlistment projection must include personnel who reenlist at some point prior to and beyond their ETS date as well as at their ETS date. The forecast methodology used the separation distributions to estimate when separation will occur and then by applying

the reenlistment rates to the projected separations, the number of reenlistments is forecast. The reenlistment distributions are used to spread the number of reenlistments over a specified time period to complete the forecast.

c. The effects of policy changes were observed in the separation and reenlistment distributions from the historical data. These observed effects can provide insights into modeling any future policy changes. Future policy changes which impact on particular subpopulation(s) could be analyzed by developing a forecast for the current policy, and then after modifying the subpopulation sizes to reflect the new policy, a new forecast could be developed. The results of the two reenlistment forecasts could then be compared to assess the impact of the change.

5. OBJECTIVES. The study objectives defined in the 1-RPM tasking directive were met as follows:

a. Objective 1. Improve first term reenlistment forecasts at the MOS level by quantifying influences within the reenlistment environment and integrating them into reenlistment projections.

(1) The objective was met by using demographic subpopulations to predict reenlistments at the Army and MOS level. This produced a significant improvement over current reenlistment projection methods. In a test case, the 1-RPM forecasting model reduced the projection error by 50 percent over the current methods which use aggregate reenlistment rates.

(2) An analysis of the effects of certain exogenous variables (unemployment rates, Consumer Price Index, and wage ratios) on first term reenlistment rates produced no significant results which could be integrated into the forecast model.

b. Objective 2. Identify and quantify trends in first term reenlistment behavior in a manner that facilitates the formulation and evaluation of accession and retention policies.

(1) This objective was met because the 1-RPM Model permits the quantifying of certain accession and retention policy changes which impact on the separation and reenlistment distributions or the number of ETS eligibles by TOS and/or subpopulation. By developing a reenlistment forecast under the proposed policy change and comparing the results to those under the current policy, the effects of the policy change can be analyzed.

(2) The separation and reenlistment distributions developed from the historical data base quantified first term reenlistment

behavior in a manner that provides insights into the development of future policy changes. Past major policy changes involved the modification of the reenlistment window. The reenlistment window is the range of time in which a soldier is eligible to reenlist; currently, the window is 180 days, which means that a soldier is not eligible to reenlist until he is within 180 days of his ETS date. Past changes in the reenlistment window affected when, relative to his ETS date, the reenlistment occurred. The trends displayed by the historical reenlistment distributions during the periods of the two policy changes (changes in the reenlistment window) provide insights into formulating and evaluating future policy changes.

6. ESSENTIAL ELEMENTS OF ANALYSIS. Listed below are the essential elements of analysis (EEA) from the 1-RPM study directive and the applicable 1-RPM study results which are responsive to the EEA.

a. "What variables external to the Army influence first term reenlistment behavior? Can the effects of the variables be quantified?" The most important factors influencing behavior of FY 73 and FY 74 accessions (soldiers whose reenlistment decisions would occur in FY 76, 77, and 78) were pay grade, race, education, term of service, sex, and age. In analyzing the reenlistment rates for personnel who reenlist/separate within one year prior to their initial ETS date, behavioral patterns could be correlated with these factors. The analysis of the effects of three exogenous variables did not yield any significant correlations.

b. "What Army policies influence reenlistment behavior? Can the effect of these policies be quantified?" The 1-RPM Study examined separation and reenlistment patterns exhibited by FY 73 and FY 74 accessions. The effects of Army policies that altered the time at which a reenlistment can occur were observed in the historical data. The changing of the reenlistment window produced changes in the reenlistment distributions that could provide valuable insights in quantifying any future changes in the reenlistment window.

c. "Can existing data and data structures be used to develop reenlistment forecasts at the MOS level that interface with the ELIM-COMPLIP Models?" No. A new Army personnel data base is currently under development which will permit the tracking of reenlistment and separation behavior at the MOS level. The current Army personnel data system maintains the present MOS for each individual but contains no MOS history for the individual. As an abstract from the current personnel data system, the 1-RPM data base does not contain sufficient information for tracking MOS

patterns for any period of time. The differing levels of aggregation and methodological differences prohibit interfacing of the two models. The 1-RPM data base provides information for forecasting in the very near term, 1 to 12 months, but does not provide sufficient data for forecasting one to five years into the future as required by the ELIM-COMPLIP Model.

d. "What kind of personnel policies can be quantified and integrated into MOS forecasting?" One of the key inputs into the forecasting model is the subpopulation, or demographic, composition of the ETS eligibles for a given period of time. A personnel policy, either at the MOS or Army level, that would modify the subpopulation profiles could be analyzed by comparing the results of the reenlistment forecasts under the conditions of new policy to the results of the reenlistment forecasts under the current policy. An example of this would be a new policy that for some reason required all reenlistment eligibles to be high school graduates. The effects of this policy change, be it at the MOS or Army level, could be examined by setting equal to zero the reenlistment rates of all subpopulations that contain non-high school graduates and making a new forecast. The results of the new forecast could be compared to the forecast based on current policy to determine the effects of the policy change on near term reenlistments.

7. OBSERVATIONS. The major observations resulting from this study of the reenlistment process are as follows:

a. The 1-RPM forecasting methodology provides a significant improvement in reenlistment projections when compared to current methods.

(1) This improvement is attributed to the use of subpopulation reenlistment rates and to the importance of the time dimension.

(2) Sensitivity analysis conducted as part of the study effort illustrated the advantage of using subpopulation reenlistment rates rather than aggregate rates.

b. It is not enough to predict the number of reenlistments. The most critical problem is to determine when the reenlistments will occur.

(1) Although the historical data reflects that the majority of reenlistments occur prior to a soldier's initial ETS, between 12 and 18 percent of the reenlistments occurred after the soldier had passed his initial ETS date.

(2) The reenlistment rates for extendees are higher than those rates for separations occurring prior to ETS.

c. The effects of policy changes which altered the size of the reenlistment window can be observed in the historical data. Changing the reenlistment window appears to have influenced when reenlistments occurred relative to an individual's ETS date. The distribution of reenlistments over the period one year prior to the ETS date illustrates the shift of reenlistments caused by the policy change. For example, the largest proportion of reenlistments occurred during the first month of reenlistment eligibility under both the 90- and 180-day reenlistment windows. These observations provide insights into quantifying future changes in the reenlistment window.

d. Analysis of two years of data on the reenlistment rates for three- and four-year term of service enlistees who separate (a reenlistment is a separation) within one year prior to ETS indicates an increase in the rates of reenlistment.

e. The most significant variables as predictors of reenlistment behavior for FY 73 and FY 74 accessions were pay grade, race, education, term of service, sex, and age.

f. The best single discriminator of reenlistment behavior is pay grade. The higher pay grade groups reenlist at a rate four or five times higher than their lower grade counterparts. This reflects the policy requiring that reenlistees must obtain a waiver if their pay grade is not E-4 or above.

g. An analysis of the effects of exogenous variables (unemployment rates, Consumer Price Index, and wage ratios) on reenlistment showed no significant relationship to the reenlistment rates.

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FIRST TERM REENLISTMENT PROJECTION BY MILITARY OCCUPATIONAL SPECIALTY (1-RPM)

CHAPTER 1

INTRODUCTION

1-1. PURPOSE. The US Army Concepts Analysis Agency (CAA) was tasked to conduct a category 1 (manpower and personnel) study to develop and implement a methodology for projecting first term reenlistments that would improve the quantitative accuracy of reenlistment projections at the military occupational specialty (MOS) level. The tasking directive also required that the methodology provide a capability to formulate and assess policies designed to influence the flow of first term reenlistments.

1-2. BACKGROUND

a. As the Army introduces more and more sophisticated equipment into its inventory, the Army must carefully manage its resources in order to maintain the quality and quantity of soldiers required to accomplish its mission. Manpower is a primary resource which must be monitored and controlled from the accession point to the point that the first term soldier enters the career force by reenlisting. The degree to which personnel managers can monitor, control, and predict the reenlistment behavior of the first term soldier directly impacts how effectively the personnel and skill requirements for the career force are met.

b. Current reenlistment projection models provide managers with reenlistment projections at an aggregated or Army-wide level. These models are limited in their ability to incorporate the effects of changes in reenlistment patterns or personnel policies.

1-3. SCOPE. The 1-RPM Study encompasses the following areas:

a. Investigation and analysis of factors that influence first term reenlistments.

b. Review and analysis of accession and reenlistment policies.

c. Review and analysis of existing forecasting methods and systems.

d. Derivation of MOS reenlistment rates.

e. Sensitivity testing of assumptions and reenlistment variables.

1-4. OBJECTIVES. The objectives of the 1-RPM Study were to:

a. Improve first term reenlistment forecasts at the MOS level by quantifying influences within the reenlistment environment and integrating them into reenlistment projections.

b. Identify and quantify trends in first term reenlistment behavior in a manner that facilitates the formulation and evaluation of accession and retention policies.

1-5. ESSENTIAL ELEMENTS OF ANALYSIS (EEA). The EEA pertaining to this study are listed below.

a. What variables (external to the Army) influence first term reenlistment behavior? Can the effects of these variables be quantified?

b. What Army policies influence reenlistment behavior? Can the effects of these variables be quantified?

c. Can existing data and data structures be used to develop reenlistment forecasts at the MOS level that interface with the ELIM-COMPLIP* Models?

d. What kind of personnel policies can be quantified and integrated into MOS forecasting.

1-6. ASSUMPTIONS. Major assumptions pertinent to the study and specified in the tasking directive are:

a. The quality of existing reenlistment data from the FY 73 and FY 74 accession files is sufficient to support statistical analysis at the MOS level.

b. The demographic content of the first term force is a valid basis for predicting reenlistment behavior at the MOS level.

1-7. STUDY LIMITS. Limits specified in the tasking directive for this study were:

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*Enlisted Loss Inventory Model - Computation of Manpower Programs Using Linear Programing (ELIM-COMPLIP) are manpower planning models used by ODCSPER to generate manpower programs.

a. The study will develop and analyze reenlistment rates for first term soldiers who in FY 76, 77, and 78 are in their third and fourth years of service.

b. MOS forecasts will be limited to soldiers entering the fourth and fifth year of service from 1-12 months in the future.

c. The study will address the feasibility, but not the actual integration, of the 1-RPM Study results and/or model into the ELIM-COMPLIP and PIA/YOS* Models and the RETAIN** System.

1-8. POLICY EFFECTS. The reenlistment policies considered in this study were:

a. The reenlistment eligibility requirement that specified that a soldier was not eligible for reenlistment, except for the good of the service, unless 21 months of active service had been completed. This policy was in effect until 1 April 1975.

b. Effective on 1 April 1975, a 90-day reenlistment window policy was established. The 90-day window meant that a soldier did not reach reenlistment eligibility until 90 days prior to ETS. This policy did not affect reenlistments classified as for the good of the service.

c. By 1 May 1977 the reenlistment window had been expanded to 180 days. The expansion process occurred over a three-month period. On 1 March 1977 the window was 120 days, on 1 April 1977 the window was increased to 150 days, and on 1 May 1977, the 180-day window was established.

1-9. STUDY REPORT. The remainder of this report presents a detailed discussion of the study methodology and applications (Chapter 2); a discussion of the data extraction processes (Chapter 3); a description of the forecast methodology (Chapter 4); and the analysis of the effects of the exogenous variables on the reenlistment rates (Chapter 5). The study observations are presented in Chapter 6, and a series of appendices provides detailed information to support specific discussions within the main report.

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*Personnel Inventory Analysis/Year of Service Model (PIA/YOS) is a ODCSPER model used to project current MOS inventories up to four years into the future.

**RETAIN is a automated reenlistment management system used by MILPERCEN.

CHAPTER 2

METHODOLOGY AND APPLICATIONS

2-1. INTRODUCTION. This methodology chapter provides a general description of each of the major steps of the 1-RPM methodology. A detailed description of the methodology and its application to the 1-RPM data base are provided in Chapters 3 and 4.

2-2. OVERVIEW. An overview of the study methodology is shown in Figure 2-1. The basic data inputs to the methodology process are current data files on nonprior service, first term soldiers with three- or four-year initial obligations. This first term data is used as a reference source of information for estimating future reenlistments. Based on the assumption that reenlistment rates are influenced by demographic characteristics, the data base is divided into disjoint subpopulations of soldiers. Each subpopulation is characterized by a unique combination of demographic characteristics (e.g., male, white, and high school graduate). The historical separation distributions, monthly reenlistment rates, and reenlistment distributions for these subpopulations are applied to the corresponding subpopulation eligibles within each MOS. The result is an estimate of reenlistments by MOS for each month in the projection period of 12 months. Analysis of manpower policies which affect the separation or reenlistment distribution may be performed by varying the distributions, repeating the forecast, and comparing the results. Manpower accession policies which affect the biographical content of the first term population may be analyzed by varying the subpopulation cell sizes and repeating the forecast. Comparison of the variations in the resultant forecasts permits the evaluation of the effect of the policy change. The remaining paragraphs discuss each step of the reenlistment projection methodology in more detail.

2-3. FIRST TERM INPUT DATA. These data consist of biographical information on all nonprior service soldiers including specific information relative to the time of entry into, and separation from, the service. The information included in this data base is shown in Table 2-1. Accession cohort files for fiscal years (FY) 73 and 74 were provided by MILPERCEN for use in this study effort. The term of service (TOS) at entry date in the files provided a basis for extracting all records of three- and four-year enlistees. These extracted records constituted the FY 73 and FY 74 historical separation and reenlistment data base for three- and four-year enlistees. This first term data base was used to develop reenlistment subpopulations, separation distributions, reenlistment distributions, and reenlistment rates, each of which is described in the succeeding paragraphs.

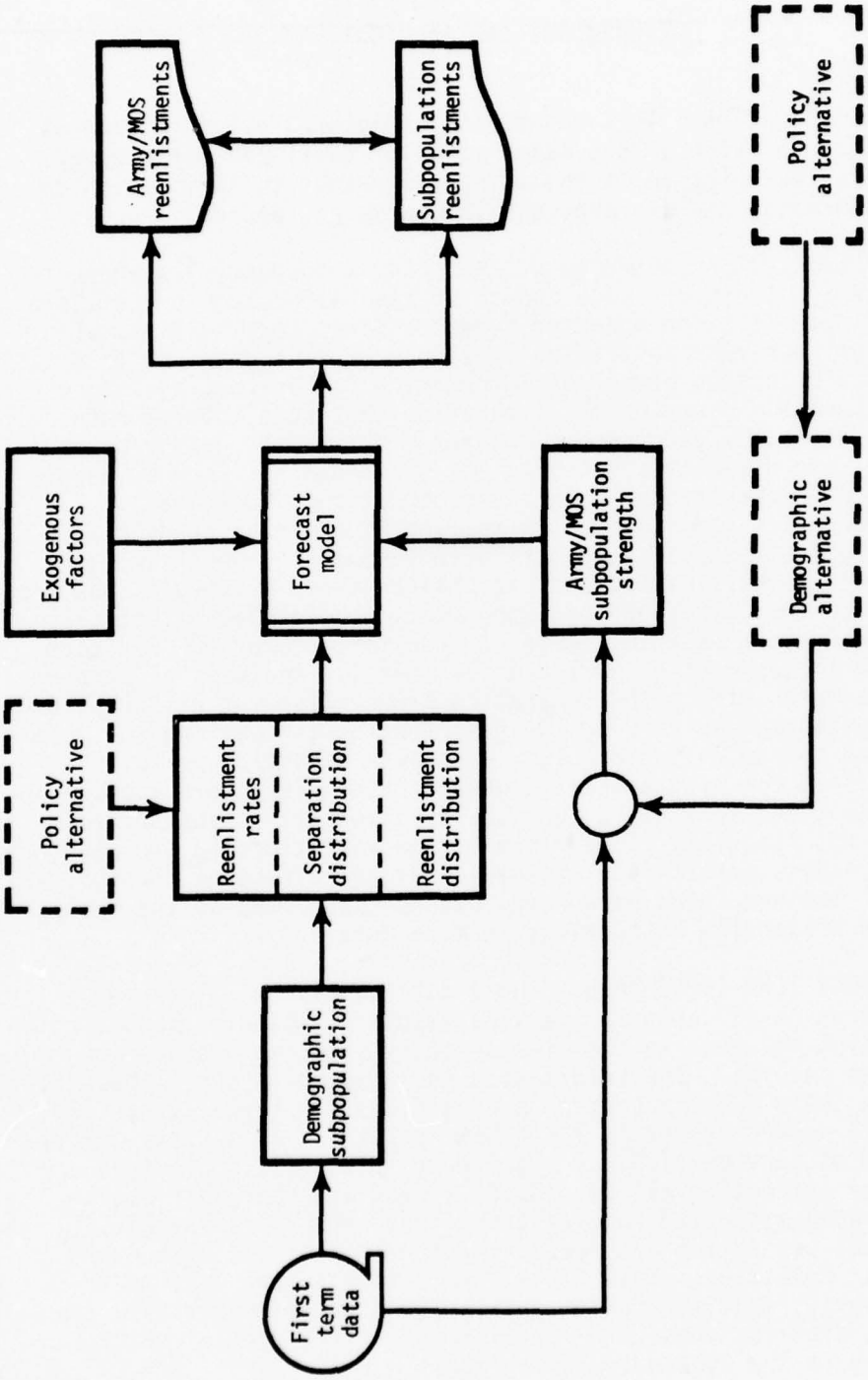

Figure 2-1. 1-RPM Methodology Overview

Table 2-1. First Term Data

Social security number	Sex
Active duty status	Separation date
Accession date	Character of separation
Date of birth	Type of separation
Age at entry	Months completed at separation
Mental category	MOS at separation
Education code	Pay grade at separation
Term of service at entry	Marital status at separation
Race	Number of dependents at separation

2-4. IDENTIFICATION OF DEMOGRAPHIC SUBPOPULATIONS. The Automatic Interaction Detector III (AID III) Model was used to determine which candidate demographic variables had a significant influence on the reenlistment rates of the FY 73 and FY 74 first term populations. For example, is there a significant difference between reenlistment rates for males and those for females? If so, then the development of separate reenlistment rates for males and females is warranted. The AID Model performs a series of successive binary splits which subdivide the entire reenlistment population into subgroups, possessing certain demographic characteristics, that display the greatest difference in reenlistment behavior. Figure 2-2 illustrates this process. In Figure 2-2, an example enlisted population of 10,000 soldiers displayed an overall historical reenlistment rate of 0.08. Within the total population, the greatest difference in reenlistment behavior was displayed between black soldiers (0.15 reenlistment rate) and white soldiers (0.05 reenlistment rate). Within the black population of 3,000, males reenlisted at a rate of 0.20 and females at a rate of 0.05. The AID Model continues this process until no significant difference in reenlistment behavior is detected or until the cell sizes become too small (user specified). The variables which the AID Model uses to split the reenlistment groups will be used to define the demographic subpopulations for which FY 73/FY 74 reenlistment rates will be developed.

*Notional
**Reenlistment rate

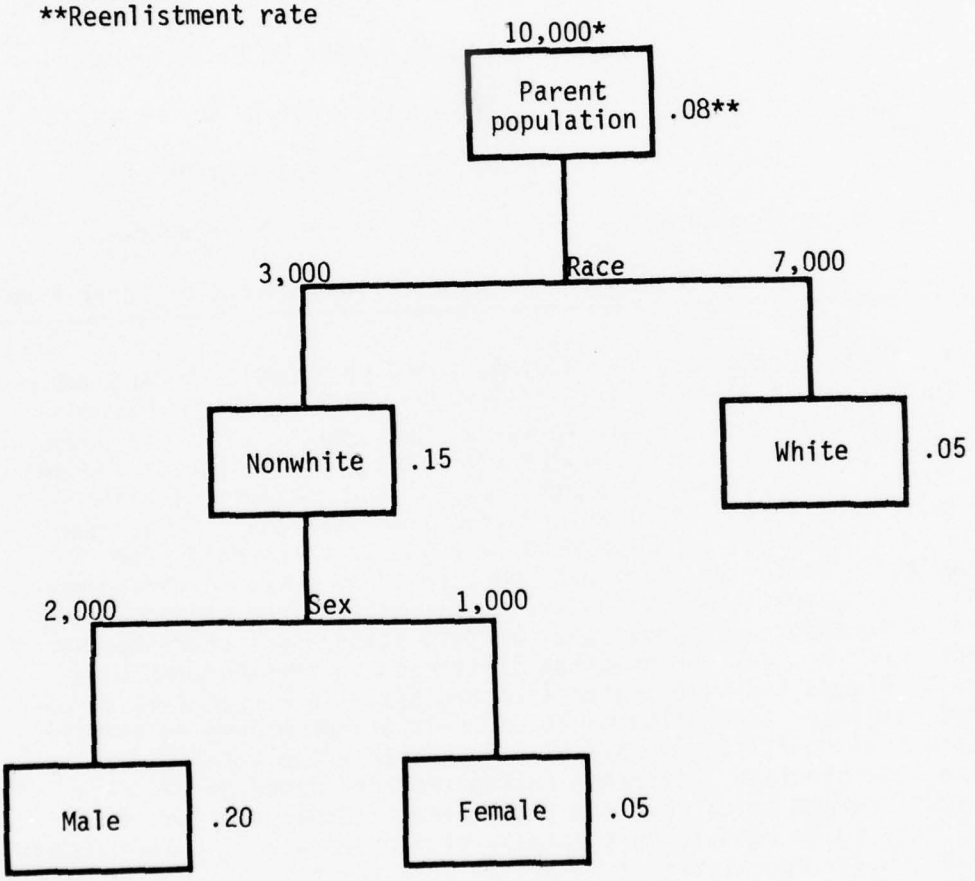

Figure 2-2. Derivation of Subpopulations Using AID III

2-5. SEPARATION DISTRIBUTIONS. Since, in order to reenlist, a soldier must first separate from the Army, an estimate of the actual point in time when each soldier will separate is a prerequisite to estimation of the number of reenlistments during each time period. To analyze the occurrences of separations, separation distributions were developed using the first term data base. Each record in the data base was examined, and the initial ETS date was computed by adding the TOS period to the accession date. The actual separation date on each record then was compared to the calculated ETS date, and the record was tallied into one of four time periods or cells based on this comparison. This division procedure is shown in Figure 2-3.

a. Cell 1 contains separations occurring more than 12 months prior to the initial or calculated ETS date. For example, if the record indicated an accession date of November 1972 and the TOS was three years, the soldier's initial ETS date would be November 1975. If the record indicated a separation date of September 1974, then the soldier separated 14 months prior to the initial ETS date, and a tally would be made in Cell 1.

b. Cell 2 contains separations occurring within one year prior to the initial ETS date. For the example described in the previous paragraph, if the separation date had been October 1975, the separation would have occurred within one year of ETS; specifically, one month prior to ETS and thus would be counted in Cell 2.

c. Cell 3 contains separations occurring between 1 and 12 months beyond the initial ETS date, i.e., an extension. For the same example, if the separation date was January 1976, then the soldier separated within the 1- to 12-month interval beyond the initial ETS; specifically, two months beyond the initial ETS and thus would be tallied in Cell 3.

d. Cell 4 contains separations occurring more than 12 months beyond the initial ETS. In the example described previously, a separation date of February 1977 would indicate a separation 15 months beyond the ETS date and therefore would be counted in Cell 4.

2-6. REENLISTMENT DISTRIBUTIONS. Reenlistment distributions were developed in a similar manner as the separation distributions described in paragraph 2-5. Instead of comparing the separation date to the ETS date, reenlistment distributions were determined by checking the separation code on the record, and if the separation code indicated that the cause of separation was for reenlistment, a tally was made in the appropriate cell.

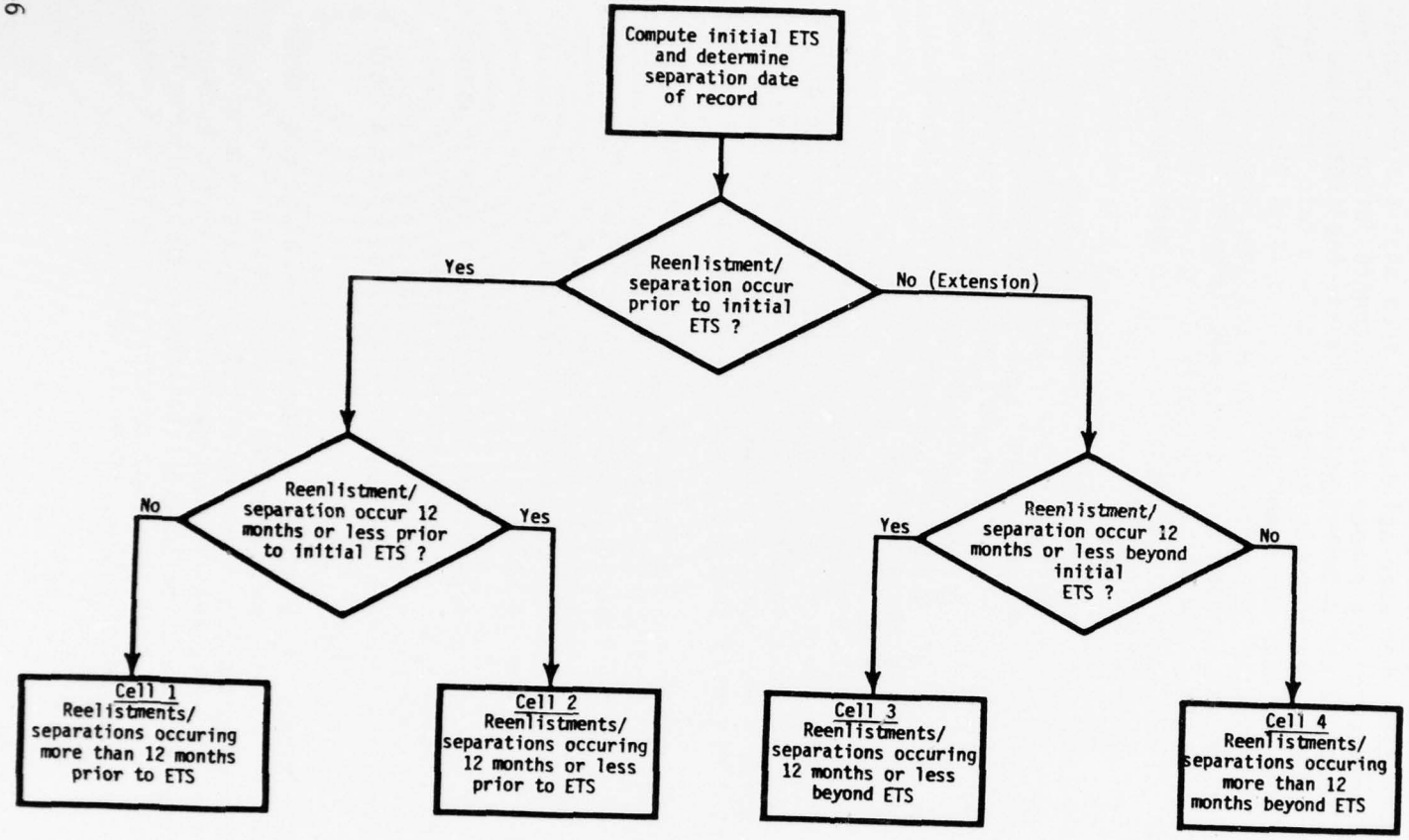

Figure 2-3. Cells for Determination of Reenlistment/Separation Distributions

Specific information is retained on reenlistments so that the month of reenlistment within each cell may be predicted. To accomplish this task, the four cells are divided into subcells which indicate in which month the reenlistments occurred within the given cell. For example, Cell 2 would be subdivided into subcells 12 through subcell 0. Subcell 12 would contain a tally of reenlistments occurring 12 months prior to ETS, subcell 11 would contain a tally of reenlistments occurring 11 months prior to ETS, and likewise, subcell 0 would contain a tally of reenlistments which occurred during the ETS month. Reenlistment distributions were determined by FY, TOS, and ETS month for Cells 2 and 3; but due to the sparcity of data for Cells 1 and 4, distributions were calculated by the number of months from ETS rather than for each specific ETS month.

2-7. REENLISTMENT RATES. Reenlistment rates analyzed in this study are computed by dividing the number of reenlistments by the number of separations.

a. Reenlistment rates are computed for Cells 1 and 4 by cohort year, term of service, subpopulation, and ETS month. Figure 2-4 graphically shows reenlistment rate calculations for one cohort year, one term of service, and one cell. For each subpopulation and ETS month, the reenlistment rate is computed as:

$$RR_{sm} = \frac{R_{sm}}{S_{sm}},$$

for each s = 1 to 24 and m = 1 to 12 where:

(1) R_{sm} is the number of reenlistments in subpopulation s and ETS month m;

(2) S_{sm} is the number of separations in subpopulation s and ETS month m; and

(3) RR_{sm} is the reenlistment rate for subpopulation s and ETS month m.

b. Reenlistment rates are computed in Cells 2 and 3 by cohort year, term of service, subpopulation, and ETS month. The total reenlistments and separations for each ETS month are computed by summing across the subcells. The reenlistment rate for each ETS month is computed by dividing the total number of reenlistments for the ETS month by the number of separations for the ETS month.

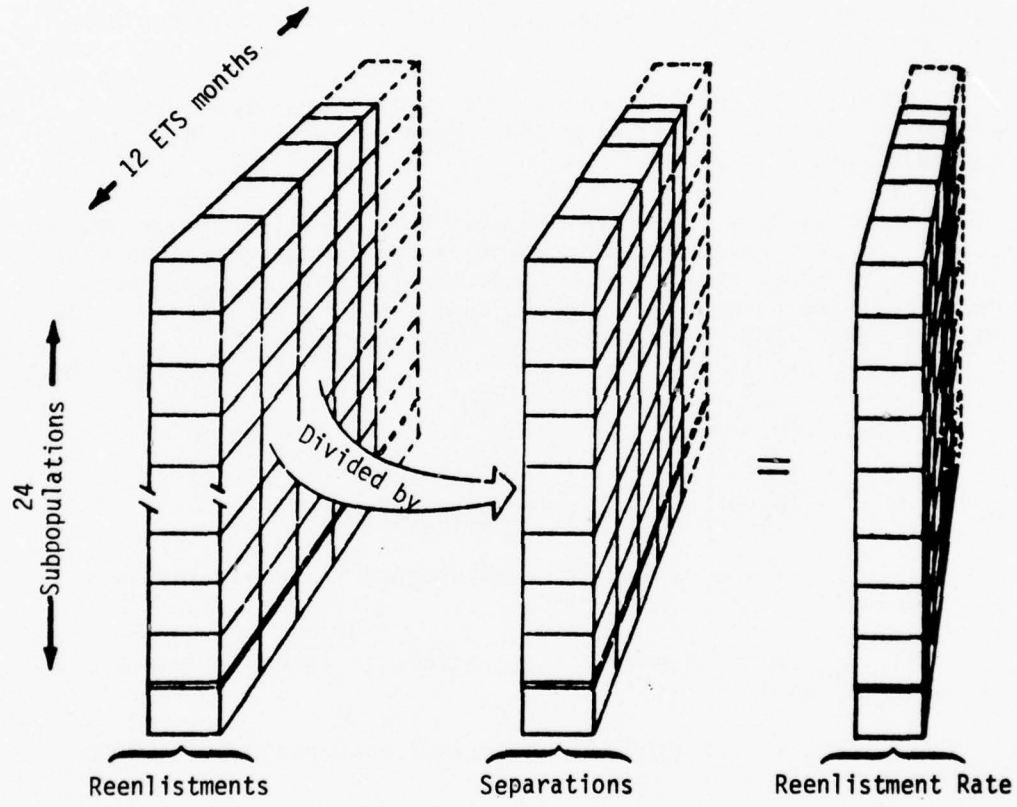

Figure 2-4. Reenlistment Rate Calculations

2-8. POLICY ANALYSIS. The effects of policy changes on first term reenlistments can be analyzed by observing patterns in the historical data. Figure 2-1 shows policy changes interjected at two points in the 1-RPM methodology.

a. Policy decisions which produced changes in the historical data can be detected by examining separation distributions during a period of time before and after the policy change. A policy change which influences when a reenlistment occurs can be reflected by changes in the reenlistment distributions before and after the change. Policy changes affecting separation distributions and reenlistment distributions also would affect the reenlistment rates. The influence of future policy changes could be quantified by modifying the separation and reenlistment distributions used as inputs into the forecast model. These modifications would be based on observations of the history of changes to these distributions caused by past policy changes.

b. If a policy decision was such that changing the size of a subpopulation was produced, then the modified subpopulation size would serve as an input to the forecast model. The results of the forecast model could be studied to determine if the desired effects of the policy decision would be achieved.

2-9. FORECAST METHODOLOGY. The purpose of the forecast methodology is to predict reenlistments for 1 to 12 months into the future. As shown in Figure 2-5, the total number of reenlistments which occur in the projection year will come from three categories of initial ETS years. A detailed discussion of the forecast methodology is contained in Chapter 4.

a. This first year group consists of personnel who were scheduled to ETS in the year prior to the projection year but who remain on active duty at the beginning of the projection year. Those remaining on active duty would be for some reason other than reenlistment (a reenlistment is a separation); so, this group of soldiers would be extendees. As shown in Figure 2-5, an estimate is made of the number of personnel from the group who will reenlist in the projection year. This estimate would be determined by first using the separation distributions to estimate the number of separations during the projection period. The reenlistment rates would be applied to the predicted separations to forecast the number of reenlistments. By applying the reenlistment distributions to the reenlistments, the reenlistments would be spread throughout the projection year.

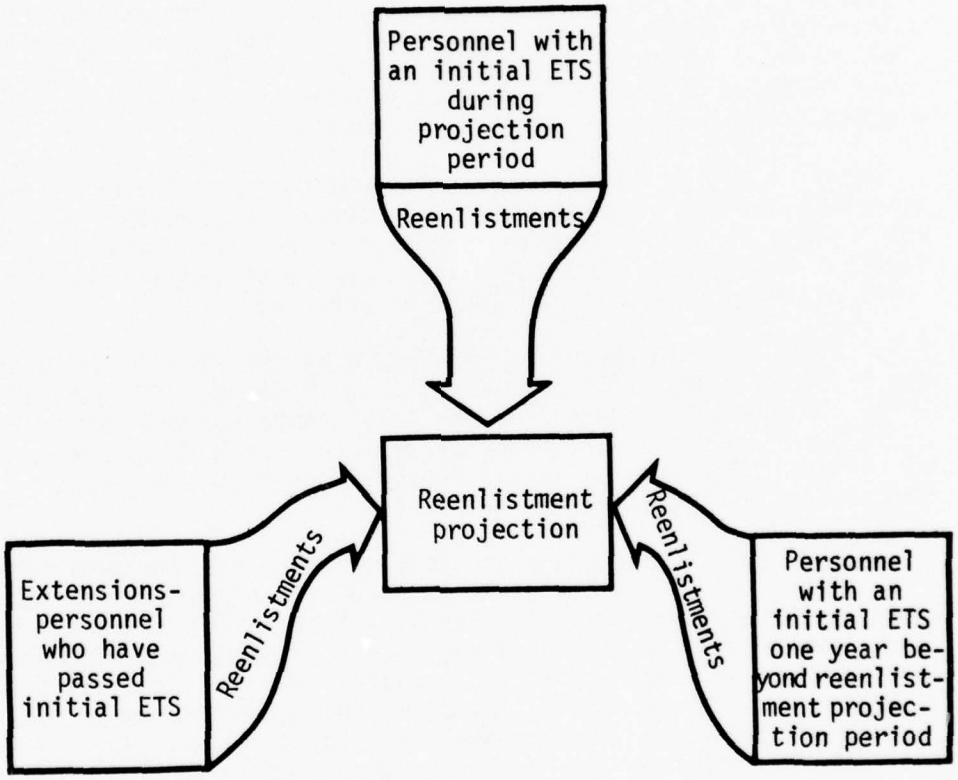

Figure 2-5. Personnel Groups Yielding Reenlistments in Projection Period

b. The second year group consists of personnel who have an initial ETS date during the projection year and are still on active duty at the beginning of the projection year. An estimate would then be made by applying the separation distributions, reenlistment rates, and reenlistment distributions to the ETS eligibles to determine the number of reenlistments which actually would occur during the projection year.

c. The third year group consists of personnel who have an initial ETS during the year following the projection year and are on active duty at the beginning of the projection year. A prediction would be made as to the number of these people who would reenlist before their initial ETS and fall into the projection year. This prediction is made by applying the separation distributions, reenlistment rates, and reenlistment distributions to the ETS eligibles.

2-10. EXOGENOUS VARIABLES. The reenlistment rates of personnel reenlisting within one year of their initial ETS date and the reenlistment rates of personnel reenlisting within one year after their initial ETS were studied for possible correlation with certain exogenous variables (see Chapter 5). The exogenous variables analyzed were the Consumer Price Index (CPI), the unemployment rate, and the military pay to civilian pay (MP/CP) ratio. Unemployment rates used in the analysis were matched as closely as possible to the subpopulation composition (for example, unemployment rates for the white, male, and young category were matched to white, male, and young subpopulation reenlistment rates.

2-11. MODEL VALIDATION. To validate the 1-RPM forecast methodology, a test prediction was made of reenlistments during a test FY 77 (July 1976-June 1977). To accomplish this test, the data base was queried to determine, at the beginning of the projection year, the active duty status of personnel with initial ETS dates in the years prior to, during, and beyond the projection year. Using these populations by ETS month and year as inputs, a projection for the test FY 77 was calculated. The results were compared to actual reenlistments from the data base. Also, as a test, a forecast was made using the techniques currently being used to predict reenlistments. Details of test results are contained in Chapter 4.

2-12. SUMMARY. The 1-RPM methodology provides for the study of reenlistment and separation behavior for two cohort years of personnel records. The historical records of reenlistment/separation behavior allow the analysis of trends and provide insights into future reenlistment patterns.

CHAPTER 3

DATA EXTRACTION PROCEDURES AND APPLICATIONS

3-1. GENERAL. The data files used for the 1-RPM Study consisted of the FY 73 and FY 74 cohort files. The two cohort files provided for this study effort were as supplied by MILPERCEN as of June 1978. Because it takes at least five years for a cohort file to be complete, i.e., all entries have separated, the FY 74 cohort file is missing numerous separation dates and other separation information. This incompleteness is particularly noticeable among the four year TOS entries. However, the FY 73 and FY 74 files for three year TOS entries are adequate for extracting data which provides some insights on separation distributions, reenlistment distributions, and reenlistment rates. This chapter describes the data files used in this study. The data was analyzed for errors and completeness. Paragraphs 3-3 through 3-5 describe the methodology for calculating the separation distribution, reenlistment distributions, and reenlistment rates and note several observations from the results of those calculations. Observations of the policy effects reflected in paragraph 3-6 provide some insights into modeling future policy changes.

3-2. COHORT DATA, STRUCTURE, AND ERROR ANALYSIS. Reenlistment trends were developed from personnel records of soldiers who entered the Army during fiscal years 73 and 74 with no prior military service. Collectively, these records comprise the FY 73/74 cohort files. The files were provided by Military Systems Division, Personnel Information Systems Directorate of MILPERCEN. The cohort files contained 362,772 personnel records with various demographic variables. Table 2-1 provides a list of the variables considered relevant to this study, though it is not an exhaustive list of the cohort variables.

a. Prior to any analysis, the cohort data were screened to eliminate early attritions and enlistment options other than three or four years of service. Early attrition is quantified as the failure of a soldier to complete 18 months of service before separating. Figure 3-1 shows how the 1-RPM data base evolved from the cohort files. The 1-RPM data base contains 60.2 percent (218,236) of the original cohort data. Early attritions account for 18 percent of the records eliminated. The remaining 21.8 percent were eliminated because the enlistment option was not three or four years, i.e., option was two, five, or six years.

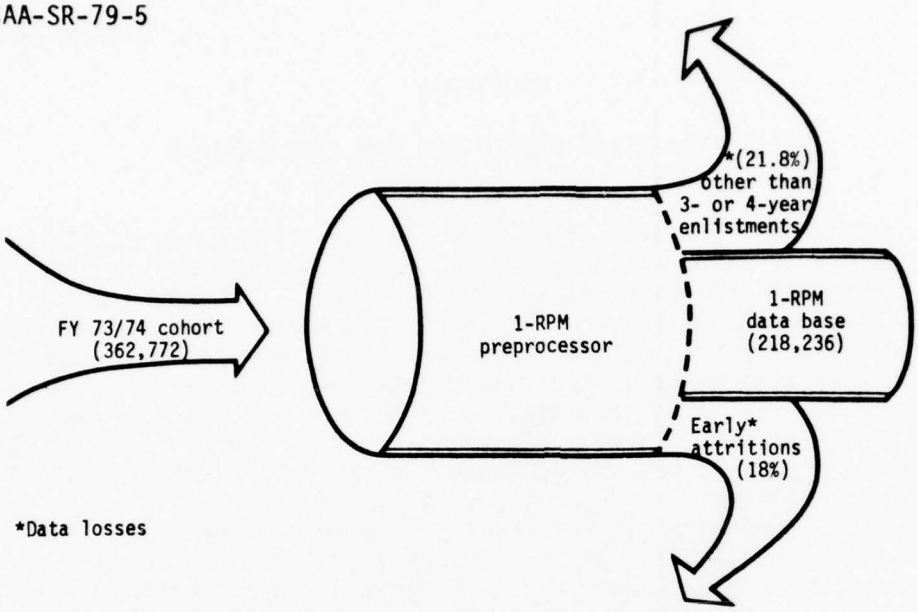

Figure 3-1. 1-RPM Data Base Development

b. Data quality was an integral part of this study. An analysis was made of the frequency at which illogical or invalid data entries occurred. This quality assurance check was to first establish reasonable bounds for each variable. A check was made of each record and if the entry for each variable on that record was not within the prescribed bounds, the entry was considered to be in error. For example, if the age code entry indicated that the soldier was 10 years of age at entry, an error obviously had occurred and an error tally was made. An assumption was made that the entries were correct if they were within the logical bounds that were established for each variable. For example, if the sex variable indicated that the individual was male, the validity of this entry was not questioned. This analysis noted the number of records that were error free, the number that had one to five errors respectively, and the number with more than five errors (see Table 3-1). In addition, an assessment was made of the error rate by individual variables (see Table 3-2). As can be determined from Table 3-1, 94.1 percent of the 1-RPM data had two errors or less. When this observation is considered concurrently with the results of Table 3-2, it is very probable that the two or less that were noted actually occurred for the marital status and/or the dependent variables. The large occurrences of errors (blank entries) for marital status and dependents precluded these variables being selected as candidate independent variables in this study.

Table 3-1. Detectable Record Error Frequency Distributions

	Percent occurrence[a]		
Error frequency	FY 73	FY 74	Total
0 (error free)	3.5	12.9	8.0
1	13.1	36.3	24.4
2	74.9	47.6	61.7
3	7.4	2.6	5.0
4	0.7	0.6	0.6
5	0.3	0.1	0.2
>5	0.2	0.0	0.1

[a]Percent occurrence reflects all variables considered and not just those variables actually used to describe demographic subpopulations and predict reenlistments.

Table 3-2. Detectable Error Frequency Distributions by Variable

Variable	Percent error occurrence		
	FY 73	FY 74	Total
Social security number	2.3	2.4	2.3
Mental group	0.8	0.5	0.6
Age code	0.5	0.4	0.5
Education code	0.2	0.3	0.3
Term of service	0.0	0.0	0.0
Race	0.0	0.0	0.0
Sex	0.0	0.0	0.0
Separation MOS	1.5	1.3	1.4
Pay grade	0.4	0.3	0.3
Marital status	88.9	84.3	86.7
Dependent code	80.8	49.4	65.6

3-3. SEPARATION DISTRIBUTIONS

a. Data Collection. As described in Chapter 2, separation distributions were constructed by examining each record and determining the difference in months between the actual separation date and the initial ETS date. Based on this difference, the record was tallied in one of four distinct cells (see Figure 2-3). Cell 1 consisted of separations occurring more than 12 months prior to ETS, and Cell 2 consisted of separations occurring 12 months to 0 months prior to ETS date. Cells 3 and 4 contain information on separation actions occurring after ETS, i.e., extensions. Cell 3 contains extensions of 1 to 12 months, and Cell 4 recorded extensions of more than 12 months. Separation distributions were determined by FY, TOS, and subpopulation. The proportion of separations for each cell was computed by dividing the value in each cell by the total for all four cells. Appendix D contains tables showing the results of this process.

b. Observations

(1) The separation distributions compiled for the two cohort files provide some important insights into separation patterns. Realizing the incompleteness of the FY 74/4 (FY 74 cohort file, four-year TOS) group, observations can be made only on the remaining three groups. Figure 3-2 shows a comparison of the proportion of separations in each cell by the two cohort years and TOS groups. A comparison of the two three-year TOS groups shows a very similar pattern. In Cell 1 the proportions vary between 0.11 and 0.12, while the values in Cell 2 are between 0.71 and 0.75. This slight difference could probably be attributed to the policy change in April 1975 that modified the reenlistment window. For example, for part of the FY 73/3 group, the requirement was for 21 months of service to be completed, and for part of that group and the FY 74/3 group, the policy requirement restricted reenlistments to 90 days prior to ETS. (This window requirement does not apply to reenlistments for the "good of the service.") The distributions for the three- and four-year TOS groups show a significant difference. A much higher proportion of the four-year TOS group falls into Cell 1, and therefore a smaller proportion of separations fall into Cell 2 when compared to the three-year TOS groups. This could be because Cell 1 for the three-year TOS group reflects separations over a six-month period and Cell 1 for the four-year TOS group reflects separation over a 18-month period.

(2) Several other observations can be made concerning separation patterns in subpopulations. In general, females tend to separate earlier than males. This was observed in the higher values in Cell 1 for females. For both males and females, the lower pay grade (E-1 to E-3) subpopulations tend to separate earlier than the E-4 and above subpopulations. Within Cell 1, the non-high school graduates separate at a higher proportion than the high school graduates. This difference between education levels is not as pronounced in Cells 2, 3, and 4. The changes in the width of the reenlistment window affect the distribution of reenlistments within Cell 2. Reenlistment distributions must be determined within cells to confirm the premise that reenlistments do not occur uniformly around an ETS month.

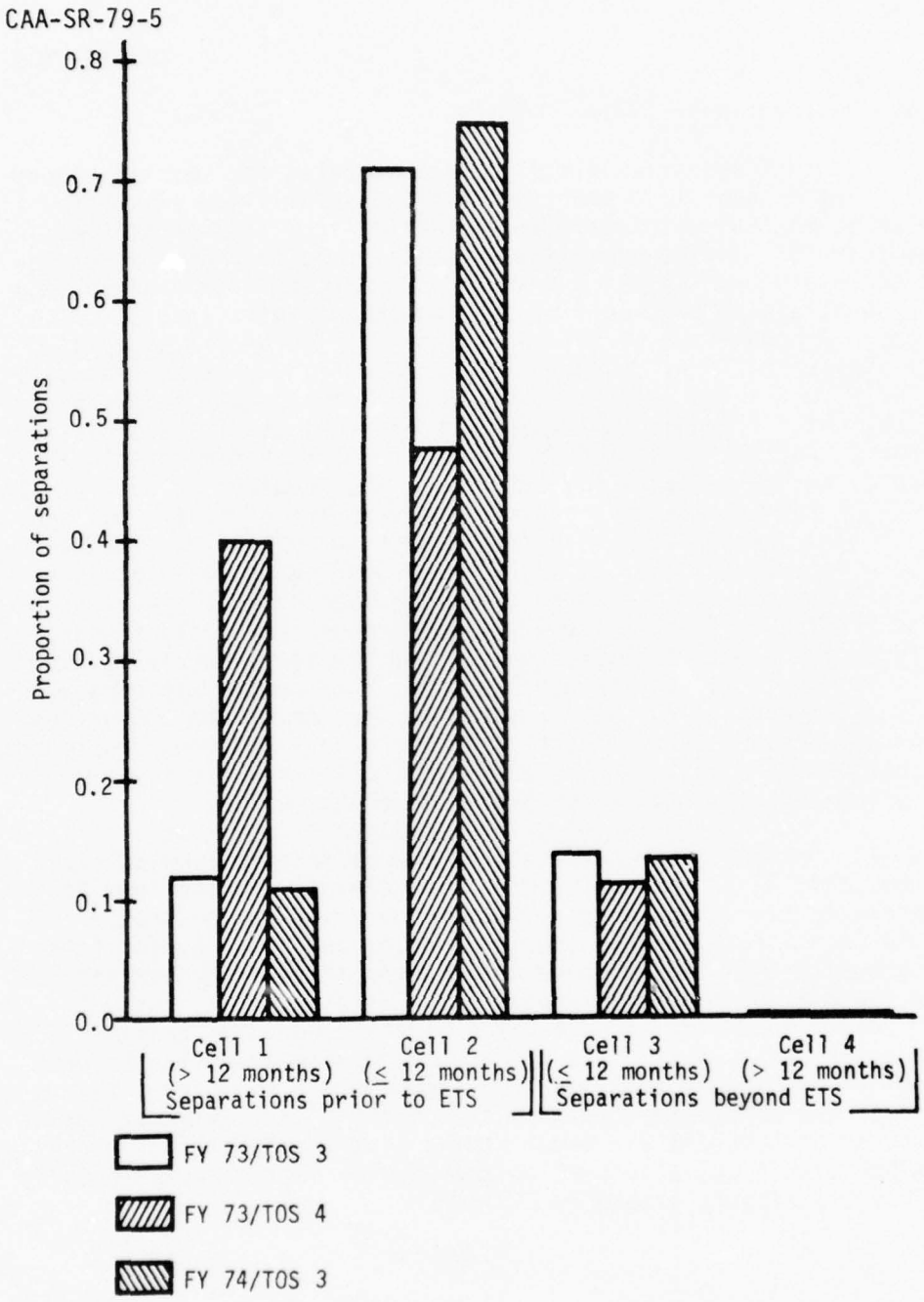

Figure 3-2. Comparison of Cohort Separation Distributions

3-4. REENLISTMENT DISTRIBUTIONS

a. Data Collection. Reenlistment distributions were developed in a fashion similar to the separation distributions. Each reenlistment was examined to determine whether it should be tallied in Cell 1, 2, 3, or 4. However, the reenlistment tally within each cell was further subdivided into the month within the cell in which the reenlistment occurred. This in effect was a subdivision of each of the cells into subcells. The reenlistment distributions are used in the forecast methodology to break down the total projected reenlistments in each cell into reenlistments by month. Separate reenlistment distributions were developed for each FY, TOS, and ETS month for Cells 2 and 3, but due to the lack of data, only for FY and TOS for Cells 1 and 4.

(1) Separate reenlistment distributions for Cells 1 and 4 were calculated for each FY cohort and each of the two TOS. However, separate reenlistment distributions were not calculated for each ETS month and subpopulation because of the scarcity of data for these cells. The 1-RPM data base was queried to extract all reenlistments and tally each of them in each cell according to the difference in months between the record's ETS date and reenlistment date. This information was collected for 36 months prior and 36 months beyond the ETS date.

(a) To compute the distributions for Cell 1, the reenlistment profiles for the reenlistments prior to ETS were used. Cell 1 is concerned with reenlistments occurring 13 months or more prior to ETS; so the total number of reenlistments for Cell 1 would be the sum of reenlistments occurring from 13 to 36 months. To determine the proportion of reenlistments for each month to ETS period, the number of reenlistments for each month is divided by the total.

(b) To compute the distributions for Cell 4, the reenlistment profiles for the reenlistments beyond the ETS date were used. The procedure for Cell 4 is the same as the one for Cell 1 except that reenlistments for 13 to 36 months beyond the ETS date are analyzed. The reenlistment proportion for each month beyond ETS period is computed by dividing each monthly reenlistment value by the total number of reenlistments for the 13- to 36-month period.

(2) The information contained in the subcells of Cells 2 and 3 is used to compute reenlistment distributions for those cells. Since the majority of reenlistments occur within the time periods covered by these two cells, the reenlistment distributions are computed by FY, TOS, and ETS month. Cell 2 for each FY, TOS, and ETS month is subdivided into subcells 12 through 0. Subcell 12

contains the number of reenlistments that took place 12 months prior to ETS; subcell 11 contains the number of reenlistments that took place 11 months prior to ETS, etc.; down to subcell 0 that contains the number of reenlistments that occurred on the ETS date. The reenlistment proportion for each subcell was computed by dividing the subcell value by the total reenlistments for that particular cell, FY, TOS, and ETS month. A similar approach is used for Cell 3 except that now the subcells indicate months beyond the ETS date. Subcell 1 contains the number of reenlistments that occurred 1 month beyond the ETS date, up to subcell 12 which contains reenlistments that occurred 12 months beyond the ETS date. The reenlistment proportion for each subcell by FY, TOS, and ETS month is computed by dividing the individual subcell values by the total number of reenlistments for that cell, FY, TOS, and ETS month.

b. Observations. In the analysis below, the historical reenlistment distributions which were derived for each of the four cells are analyzed. First, the cell reenlistment distributions for each cell were compared to each other and then the distributions for each cell were individually analyzed.

(1) A comparison of the reenlistment distributions for each of the cells is shown in Figure 3-3. The fiscal year 74 cohort file, four-year TOS profile is not shown because the incomplete data would depict a distorted picture of the distributions for this cell. As would be expected, the largest proportion of reenlistments occur in Cell 2. The FY 73 cohort data indicate a large proportion of reenlistments occurring in Cell 1. As will be discussed in more detail in paragraph 3-6, this was a result of the reenlistment policy during that period that permitted reenlistments when 21 months of service were completed. With more reenlistments in Cell 1, Cell 2 reflects a smaller proportion of reenlistments. The values for Cell 3 indicate that the reenlistment policy changes had no significant effect on 1- to 12-month extendees who reenlisted. A small difference in behavior between three- and four-year termers can be observed in Cell 3, although the difference is not significant enough to draw any conclusions.

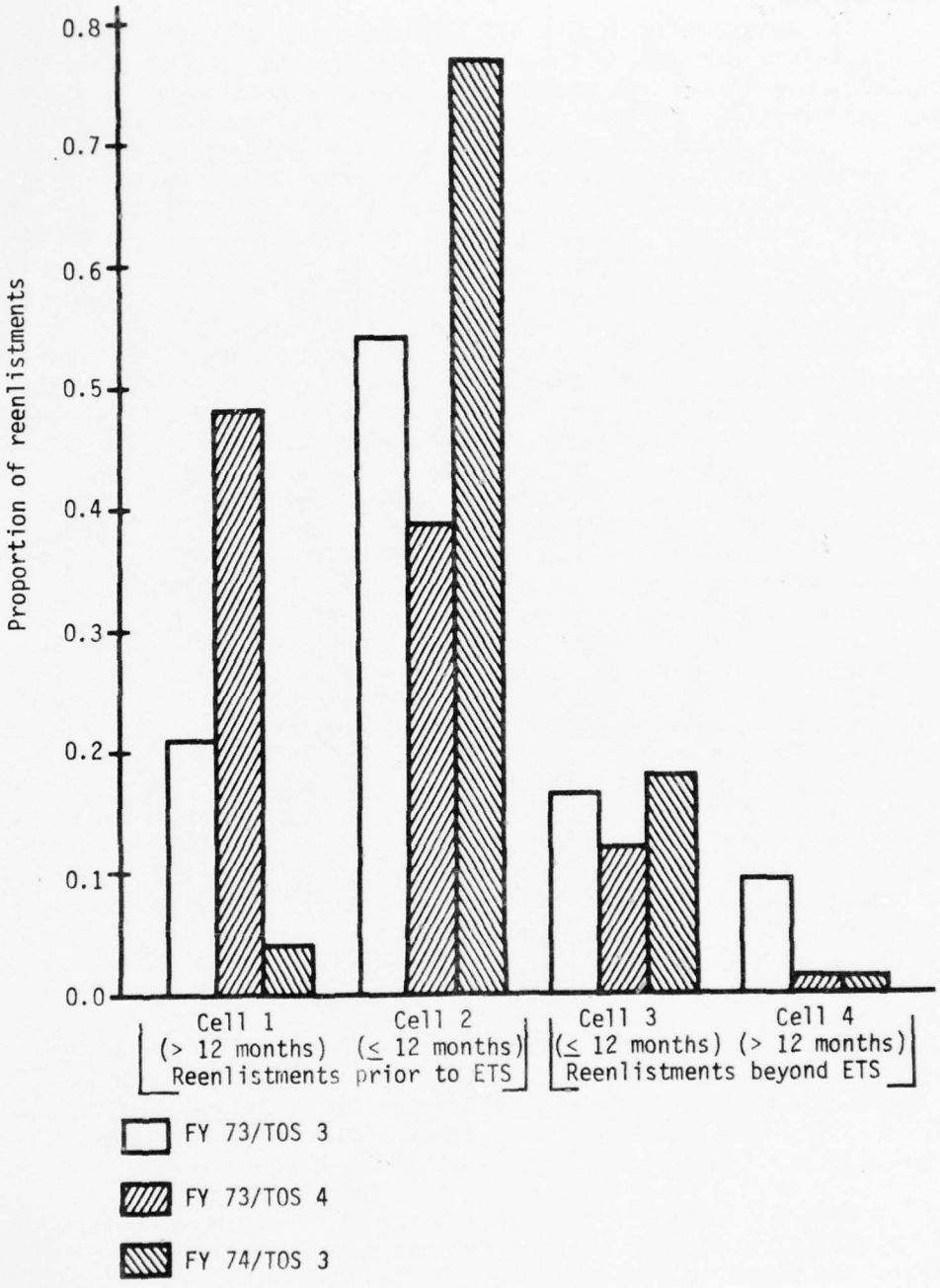

Figure 3-3. Comparison of Cohort Reenlistment Distributions

(2) As shown by Figure 3-3, the majority of reenlistments occurs in Cells 2 and 3; therefore, further analysis of these cells is warranted. To analyze the trend of reenlistments for the two cohort files, Cells 2 and 3 were examined together so as to cover a two-year period--reenlistments occurring one year prior to ETS through reenlistments occurring one year beyond initial ETS. Figure 3-4 shows for the FY 73 cohort file the proportion of reenlistments occurring in each relative month to ETS. The three-year TOS line shows a significant proportion of reenlistments in the 12 to 4 months prior to ETS area. This is a result of the reenlistment policy during this period. Portions of the FY 73/3 TOS group were affected by the 90-day reenlistment window which is illustrated by the sudden increase in proportion of reenlistments at the three months to ETS point. Because of the effects of changing the reenlistment window from 90 to 180 days during this period, the graph is bell-shaped between the -4 to +1 points on the graph. The line for extendees is a smooth decreasing curve from the ETS point to the 12 months beyond ETS point. The FY 73/4 TOS group reflects the 90-day reenlistment window policy effects exclusively (no window change), i.e., a relatively small proportion of reenlistments occurring between 12 and 4 months prior to ETS and then a big jump at the 3 months to ETS point. Of particular note is the same general trend of the reenlistment distributions for extendees for the three- and four-year TOS groups. Figure 3-5 is a graph showing the reenlistment distribution across Cells 2 and 3 for the FY 74 cohort file. The three-year TOS group was subject to a 90 day window, and this can be easily observed from the spike in the graph at the three months to ETS point. As observed in the FY 73 graphs, the FY 74 cohort shows a similar relatively smooth decreasing trend for extensions. The FY 74/4 TOS group was affected by the reenlistment policy change that extended the reenlistment window from 90 days to 180 days. Although the data available for that year group are limited, the window effect can be observed.

3-5. REENLISTMENT RATES. Reenlistment rates were computed at a level of detail sufficient to observe the differences between aggregate rates and reenlistment rates by subpopulation. If no differences could be observed, then there would be no advantage to analyzing and forecasting reenlistments by subpopulations.

a. Data Collection. The reenlistment rates generated from the 1-RPM data base for use in the forecast model are computed by dividing the number of reenlistments by the number of separations for the desired level of detail. The required level of detail for the 1-RPM Study is cohort year, term of service, subpopulation, and accession (or ETS) month for Cells 1 through 4. Appendix D contains tables of reenlistment rates computed for use in this study.

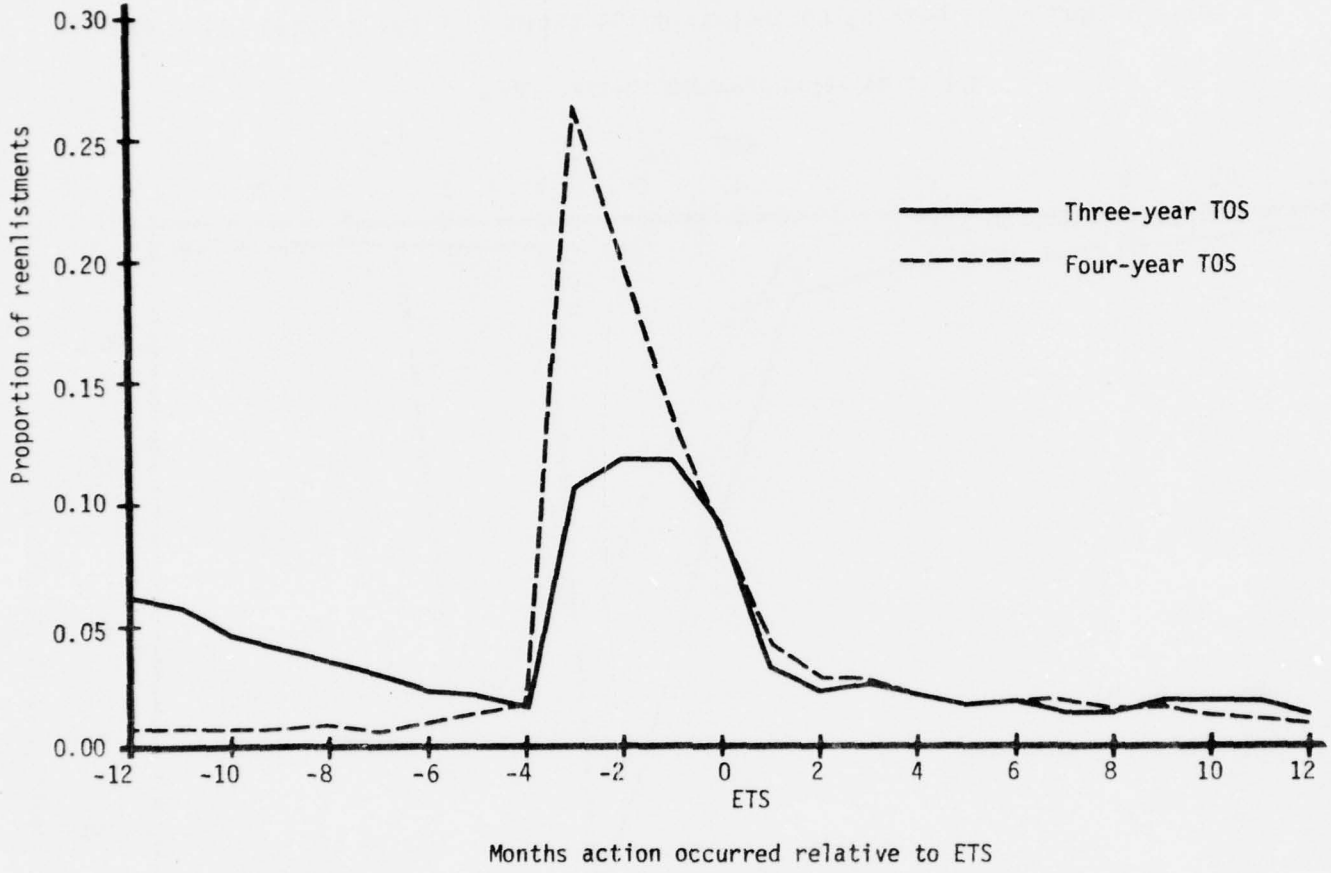

Figure 3-4. Cells 2 and 3 Reenlistment Distribution for the FY 73 Cohort File

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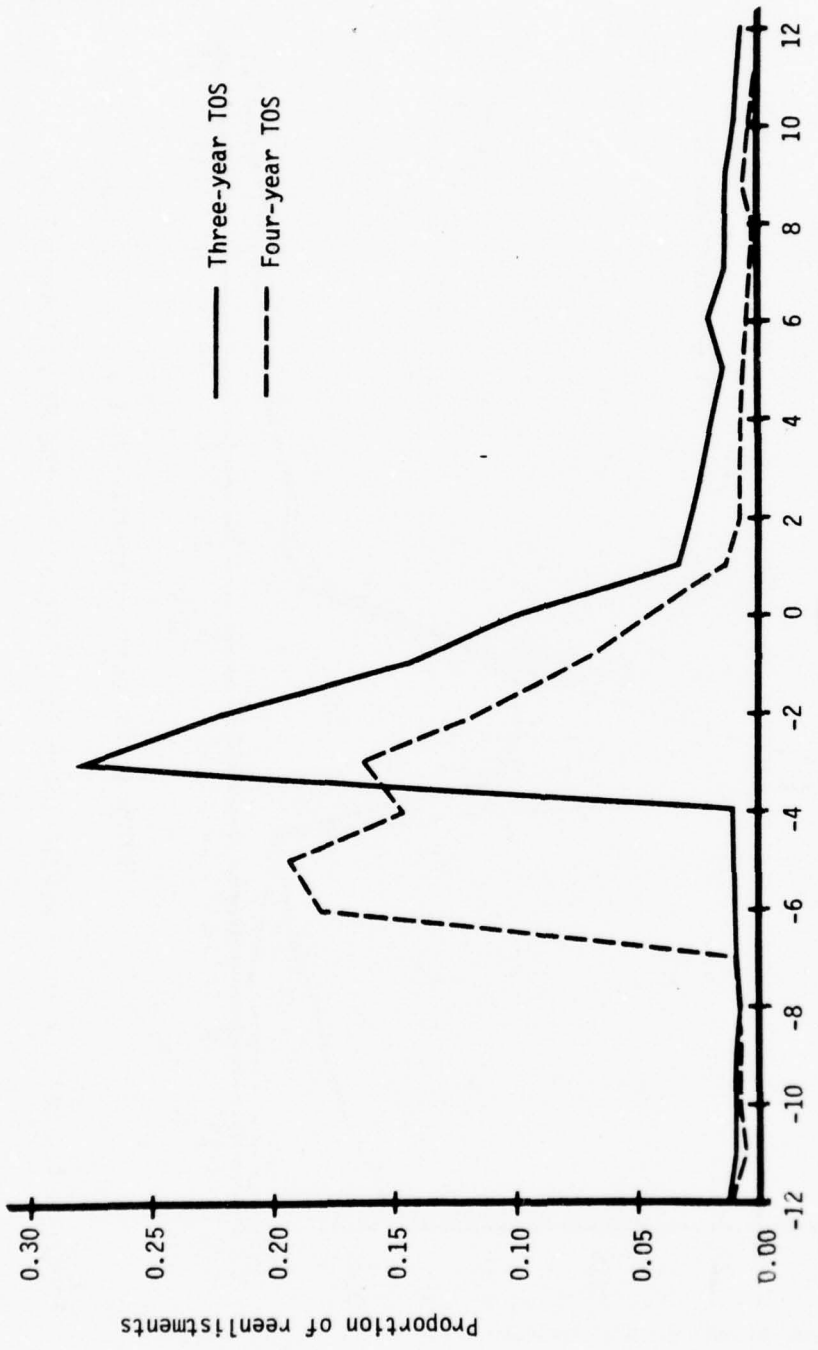

Figure 3-5. Cells 2 and 3 Reenlistment Distribution for the FY 74 Cohort File

b. Observations

(1) By analyzing the reenlistment rates at different levels of aggregation, some patterns can be observed. Tables 3-3 and 3-4 show the rates aggregated at the FY, TOS, subpopulation, and cell levels. In general, the composite rates for the two cohort files indicate that four-year termers reenlist at a higher rate than three-year termers. From Tables 3-3 and 3-4, some observations can be made about some of the demographic subpopulations. Except for Cell 1, the reenlistment rates for females at the composite level are higher than the rates of males. Within the male (subpopulations 1-16) and female (subpopulations 17-24) groups, certain patterns can be seen in both. The higher pay grade personnel reenlist at a higher rate; in most cases four or five times higher, than their lower grade counterparts. The nonwhite groups show reenlistment rates that are, in general, 40 to 50 percent higher than the white subpopulations. High school graduates tend to reenlist at a higher rate than non-high school graduates. The older soldiers have a higher rate than the younger ones, but the difference is not as pronounced as the comparison of the other demographic variables (sex, pay grade, race, and education).

(2) With the largest proportion of reenlistments occurring in the 12-0 months prior to ETS time period (Cell 2), a graphics analysis was performed to compare the individual subpopulation reenlistment rates to composite reenlistment rates of all subpopulations. This composite rate is an aggregated reenlistment rate; i.e., the total separations for all reenlistments for all subpopulations is divided by the total separations for all subpopulations. The composite rate for three-year TOS personnel for the 1-RPM data base is shown at Figure 3-6, and the four-year TOS group composite rate is shown at Figure 3-7. A gradual increase in the reenlistment rates for both groups can be observed to have occurred over the two-year period shown for the figures. Figures 3-8 through 3-11 illustrate the wide variability of some of the subpopulations versus a composite rate. Figure 3-8 shows an example of a subpopulation that consistently has a reenlistment rate lower than the composite rate. Figure 3-9 is an example illustrating the behavior of the largest subpopulation (subpopulation 11--male, E-4, white, young, high school graduate category) relative to the composite rate. The rates are generally lower, but the basic trend is similar. In Figure 3-10 subpopulation 14 rates are shown as being highly variable but generally higher than the composite rate. Figure 3-11 illustrates the relationship between the female reenlistment rate and the composite rate. With the exception of two months (December 1976 and January 1977), the female rate was much higher than the composite rate.

Table 3-3. Reenlistment Rates by Cell and Subpopulation for the FY 73 Cohort File

Subpopulation	Three-year term of service				Four-year term of service			
	Cell 1	Cell 2	Cell 3	Cell 4	Cell 1	Cell 2	Cell 3	Cell 4
1	.0764	.0364	.0534	.3258	.0922	.0617	.1491	.0000
2	.0789	.1010	.0926	.7500	.1667	.1000	.0909	.0000
3	.0975	.0475	.0671	.3991	.1033	.0453	.2010	.0000
4	.1316	.0767	.1238	.3448	.1267	.0660	.3542	.3333
5	.1116	.0286	.0240	.3208	.0875	.0313	.0588	.0000
6	.1132	.0971	.0435	.2500	.1026	.0000	.1000	.0000
7	.1175	.0680	.0667	.2857	.1172	.0767	.1765	.0000
8	.1692	.0685	.1034	.2353	.0980	.0536	.4545	.0000
9	.6946	.1426	.2023	.5412	.5452	.1760	.3191	.2500
10	.7941	.1842	.2373	.7778	.6710	.1373	.6250	.0000
11	.6411	.1224	.2327	.5159	.5483	.2321	.2850	.2700
12	.6474	.1582	.2734	.4790	.6083	.2451	.3136	.5000
13	.7959	.2294	.2611	.6622	.6494	.2126	.2500	.1667
14	.8064	.2484	.2941	.4615	.7407	.2632	.3636	.0000
15	.7569	.2739	.4033	.6677	.6585	.4494	.3824	.6923
16	.8300	.2776	.3916	.6379	.6329	.4314	.4773	.6000
17	.0587	.1373	.1081	.4348	.0000	.1250	.5000	.0000
18	.0345	.0667	.1667	.6154	.0000	.1667	.0000	.0000
19	.0000	.2097	.2143	.2857	.0000	.0000	.0000	.0000
20	.2778	.0714	.1000	.3333	.0000	1.0000	.0000	.0000
21	.1779	.1924	.2946	.4286	.1020	.2152	.2500	.6000
22	.2344	.2901	.3716	.4667	.2308	.2045	.7500	.0000
22	.4400	.3882	.4452	.6500	.3333	.4167	.3333	.0000
24	.1714	.4303	.6226	.4444	.3333	.4000	.0000	.0000
Composite	.2994	.1372	.2148	.5022	.2977	.2002	.2654	.2851
Male	.3191	.1449	.2036	.5061	.3048	.1996	.2631	.2804
Female	.1395	.2478	.3424	.4602	.0519	.2284	.3696	.4286

Table 3-4. Reenlistment Rates by Cell and Subpopulation for the FY 74 Cohort File

Subpopulation	Three-year term of service				Four-year term of service			
	Cell 1	Cell 2	Cell 3	Cell 4	Cell 1	Cell 2	Cell 3[a]	Cell 4[a]
1	.0068	.0363	.1108	.0000	.0000	.3214	.0000	.0000
2	.0214	.0530	.1468	.0000	.0000	.0000	.0000	.0000
3	.0241	.0392	.1127	.1304	.0248	.2710	.1034	.0000
4	.0559	.0616	.2920	.5000	.0333	.4322	.0833	.0000
5	.0046	.0418	.1071	.0238	.0000	.2222	.0000	.0000
6	.0000	.0668	.1946	.2500	.0000	.0000	.0000	.0000
7	.0088	.0747	.2425	.2143	.0323	.3941	.1053	.0000
8	.0213	.0924	.2434	.5000	.0319	.5466	.0000	.0000
9	.2256	.2356	.2461	.4677	.0952	.2955	.6000	.0000
10	.1837	.3603	.3305	.6667	1.0000	.3333	.0000	.0000
11	.3704	.2037	.2838	.4356	.3564	.2829	.2202	.0000
12	.4766	.2832	.3794	.4259	.4266	.3514	.2921	.0000
13	.3596	.3676	.3581	.3889	1.0000	.4375	.0000	.0000
14	.4000	.4428	.3958	.4000	.0000	.5000	.0000	.0000
15	.5379	.4060	.4661	.5405	.4015	.5094	.2708	.0000
16	.3860	.4373	.4333	.7692	.3562	.4645	.3913	.0000
17	.0073	.0593	.3166	.2500	.0000	.3846	.0000	.0000
18	.0278	.0492	.3475	.0000	.0000	.2692	.0000	.0000
19	.0392	.1111	.4747	.6667	.0000	.0000	.0000	.0000
20	.0370	.0909	.5167	.0000	.0000	.5000	.0000	.0000
21	.0678	.2166	.3059	.4286	.0000	.2157	.2778	.0000
22	.0994	.3136	.3553	.4286	.1176	.1163	.1000	.0000
23	.2273	.4392	.5000	.2727	.0000	.3333	1.0000	.0000
24	.2414	.5209	.6263	.8571	.3333	.8000	.0000	.0000
Composite	.0764	.2147	.2763	.3715	.1799	.3362	.2192	.0000
Male	.0781	.2091	.2593	.3611	.1865	.3382	.2189	.0000
Female	.0620	.2654	.3731	.4342	.0268	.2454	.2258	.0000

[a]Data incomplete in these cells

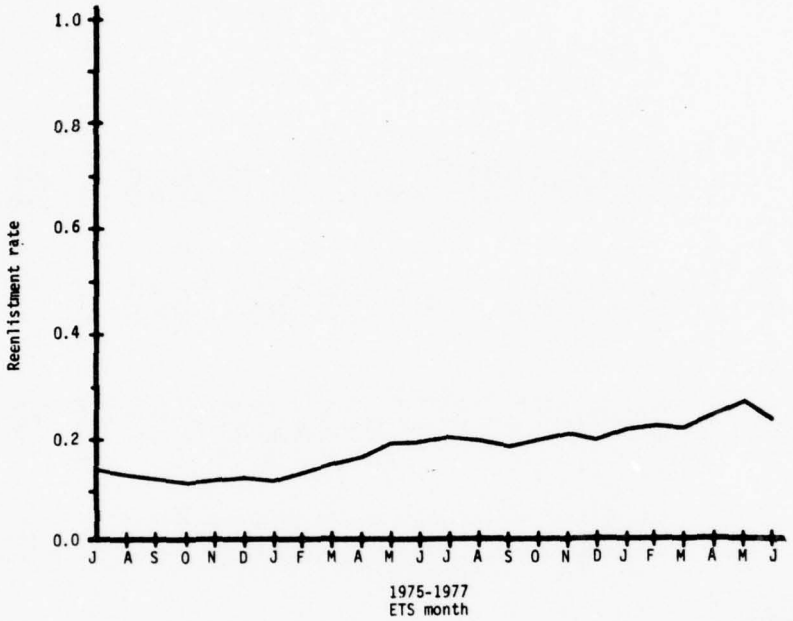

Figure 3-6. Composite Reenlistment Rates for Three-year TOS Soldiers in Cell 2

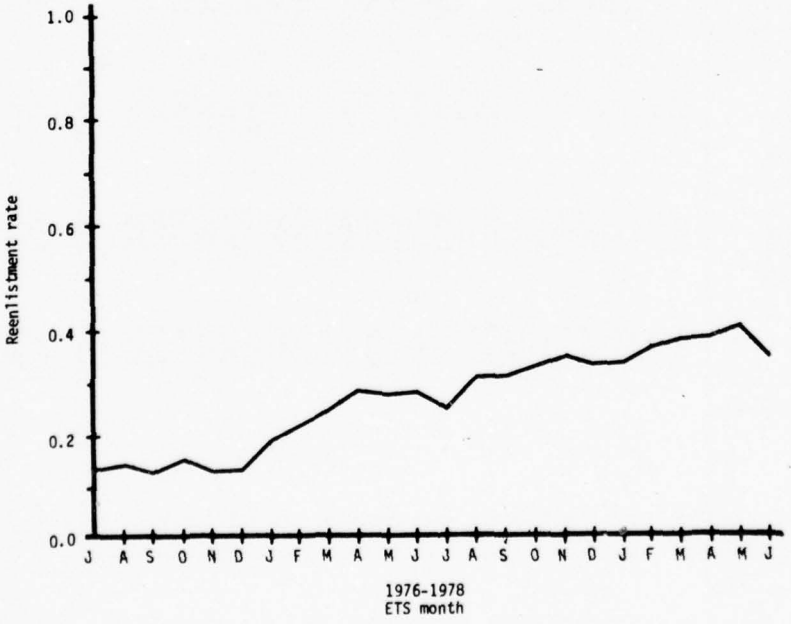

Figure 3-7. Composite Reenlistment Rates for Four-year TOS Soldiers in Cell 2

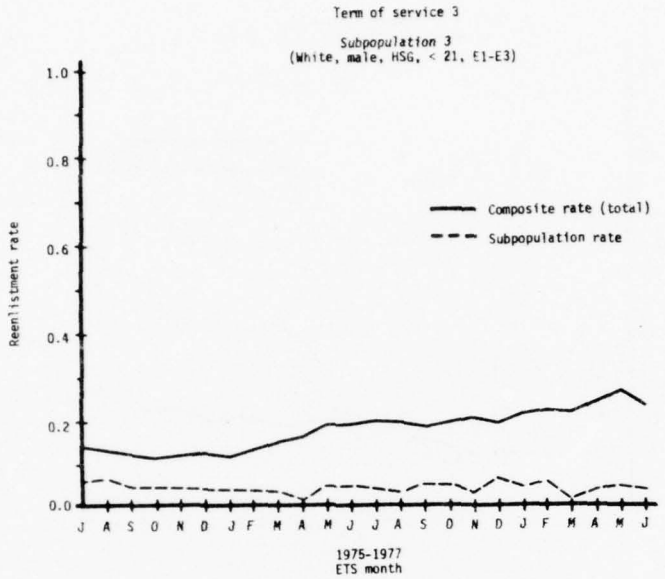

Figure 3-8. Composite Reenlistment Rates vs Subpopulation 3 Reenlistment Rates in Cell 2

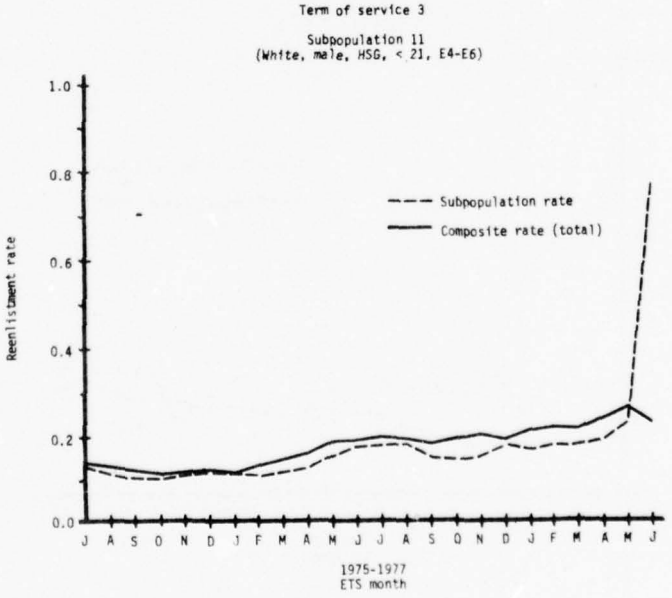

Figure 3-9. Composite Reenlistment Rates vs Subpopulation 11 Reenlistment Rates in Cell 2

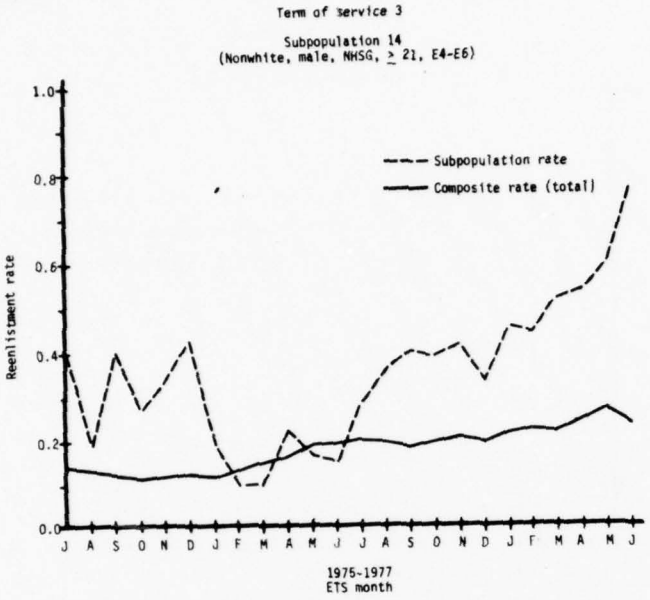

Figure 3-10. Composite Reenlistment Rates vs Subpopulation 14 Reenlistment Rates in Cell 2

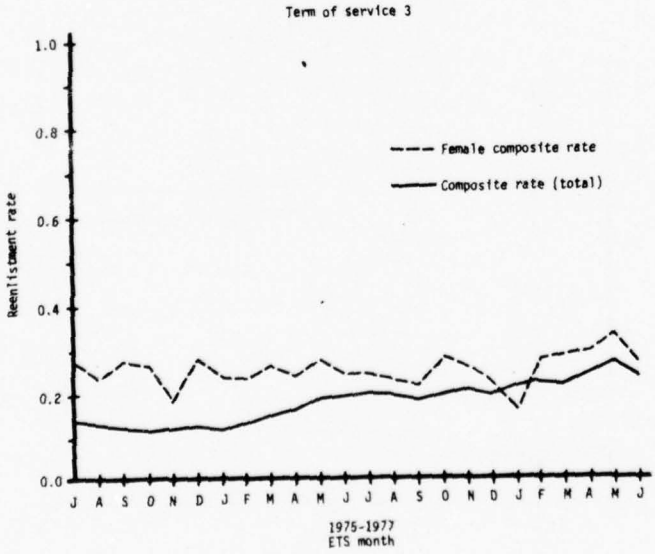

Figure 3-11. Composite Reenlistment Rates vs Female Composite Reenlistment Rates in Cell 2

(3) As observed in our analysis of reenlistment distributions in paragraph 3-4, between 12 and 18 percent of the total number of reenlistments occurred in Cell 3. Thus realizing the contribution of short term (1-12 months) extensions in making a reenlistment forecast, the reenlistment rates within Cell 3 were examined graphically to observe subpopulation reenlistment rate patterns. Figure 3-12 shows the composite rate for three-year termers. The rates show some fluctuations, but no obvious trends can be observed. The composite rate for the four-year TOS group (Figure 3-13) shows a declining reenlistment rate, but this is misleading because the data source for the second year in the curve is the FY 74 cohort file. As mentioned before, the data for this year and TOS group are incomplete, especially in Cells 3 and 4, so any observations made from that data should be made with great caution. The composite rate for Cell 3 was compared to the subpopulation rates as was done for Cell 2 in the preceding paragraph. Figure 3-14 shows a reenlistment rate for subpopulation 3 that is generally much lower than the composite rate. An examination of the rate for subpopulation 11 (Figure 3-15) shows that the rate of the largest subpopulation oscillates about the composite. As seen in Figure 3-16, the rate for subpopulation 12 is higher than the composite for all but two months. A comparison of the reenlistment rate for female extendees and the composite rate (Figure 3-17) illustrates that the female rate is consistently higher than the composite rate.

3-6. POLICY CHANGES REFLECTED IN HISTORICAL DATA

a. General. As discussed in Chapter 1, two major reenlistment policy changes occurred during the period covered by the 1-RPM data. Both of these changes primarily affected the reenlistment distributions for the year/TOS groups who ETS'd before and after the effective date of the change. The first change was effective in April 1975 and the new policy created a reenlistment window of 90 days. The previous requirement was that a soldier had to have completed 21 months of service before reaching eligibility to reenlistment for any cause other than for the "good of the service." In March 1977, the reenlistment window was increased to 120 days and increased each month by 30 days until May 1977, at which time the window was 180 days. The current policy is the 180-day window. The following paragraphs report on how the various policy changes could be observed in the historical data.

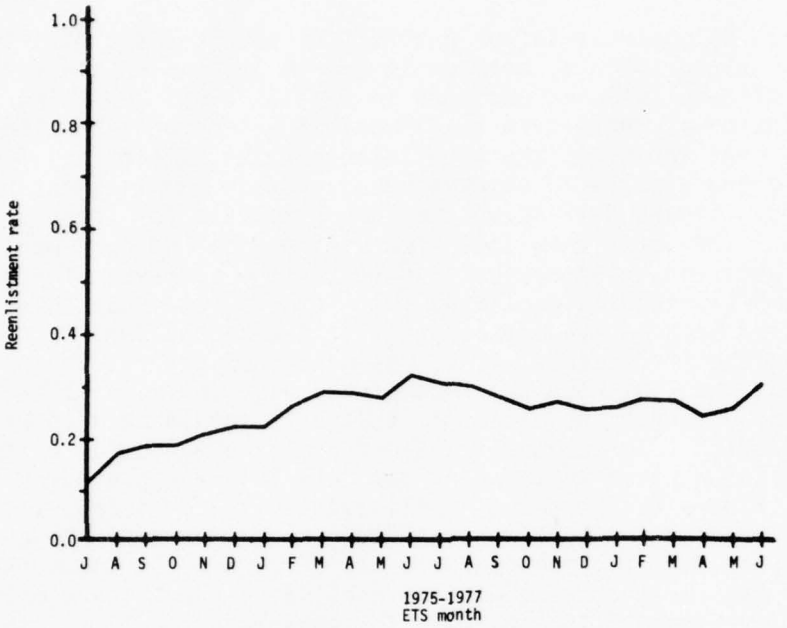

Figure 3-12. Composite Reenlistment Rates for Three-year TOS Soldiers in Cell 3

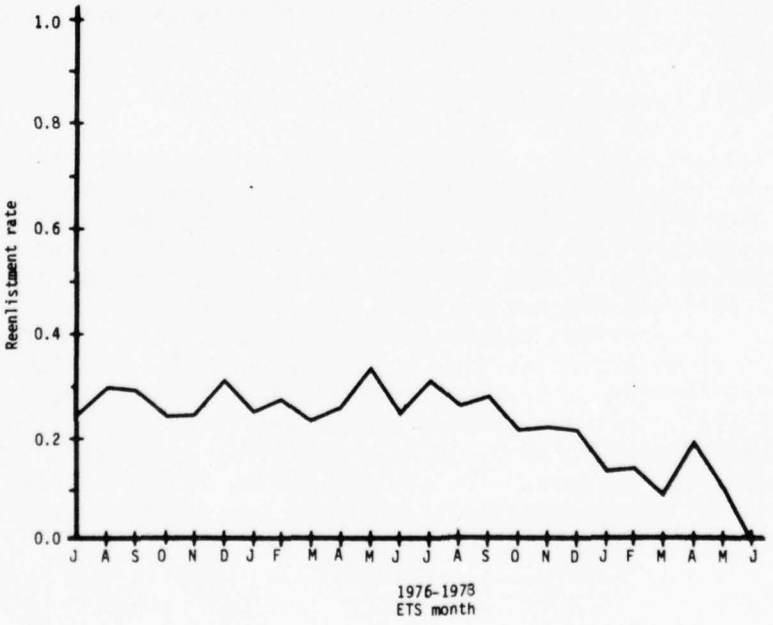

Figure 3-13. Composite Reenlistment Rates for Four-year TOS Soldiers in Cell 3

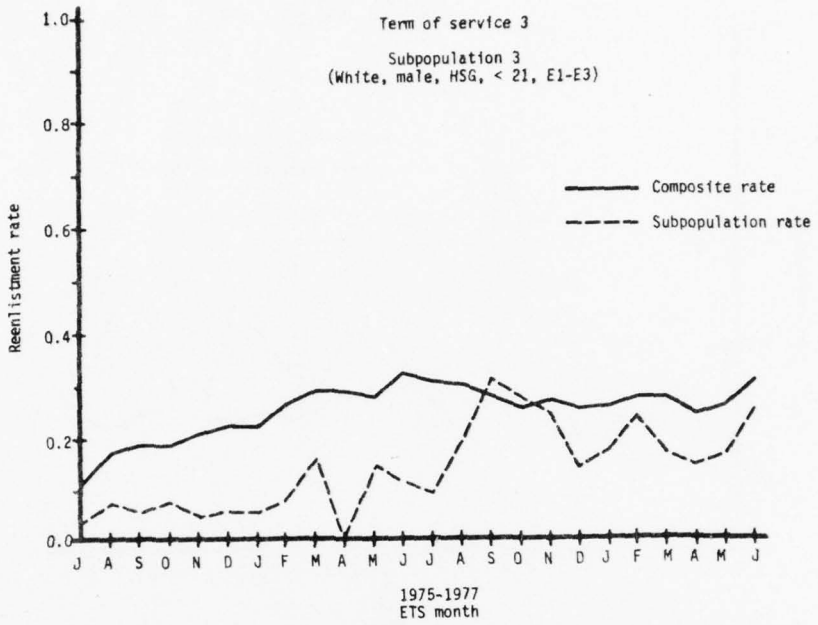

Figure 3-14. Composite Reenlistment Rates vs Subpopulation 3 Reenlistment Rates in Cell 3

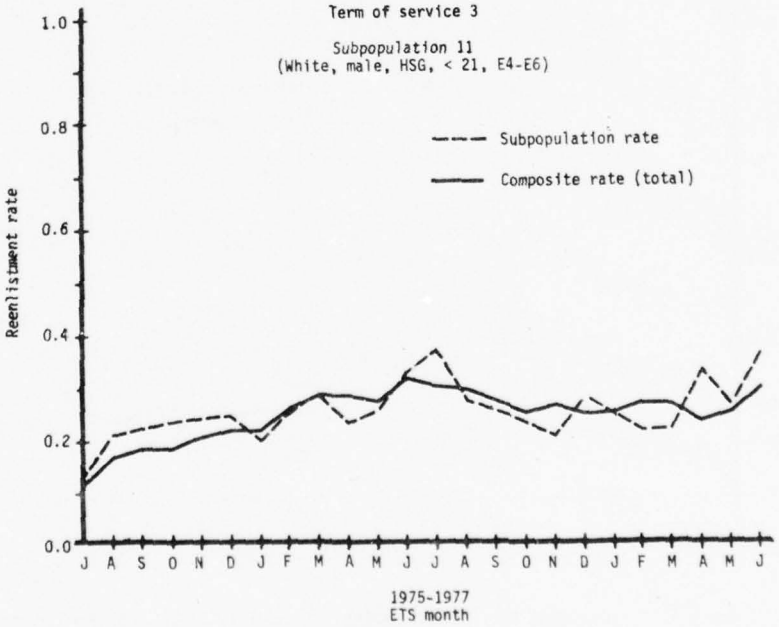

Figure 3-15. Composite Reenlistment Rates vs Subpopulation 11 Reenlistment Rates in Cell 3

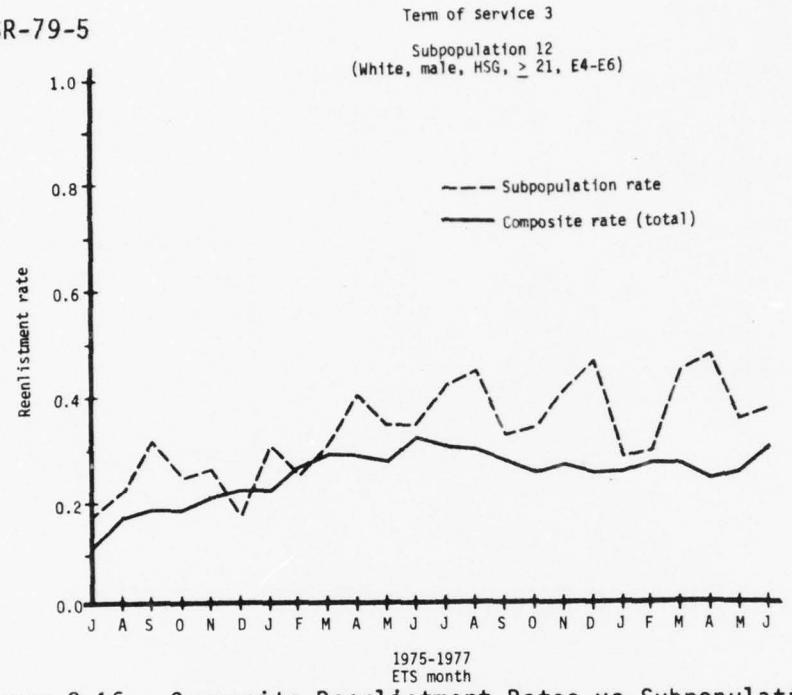

Figure 3-16. Composite Reenlistment Rates vs Subpopulation 12 Reenlistment Rates in Cell 3

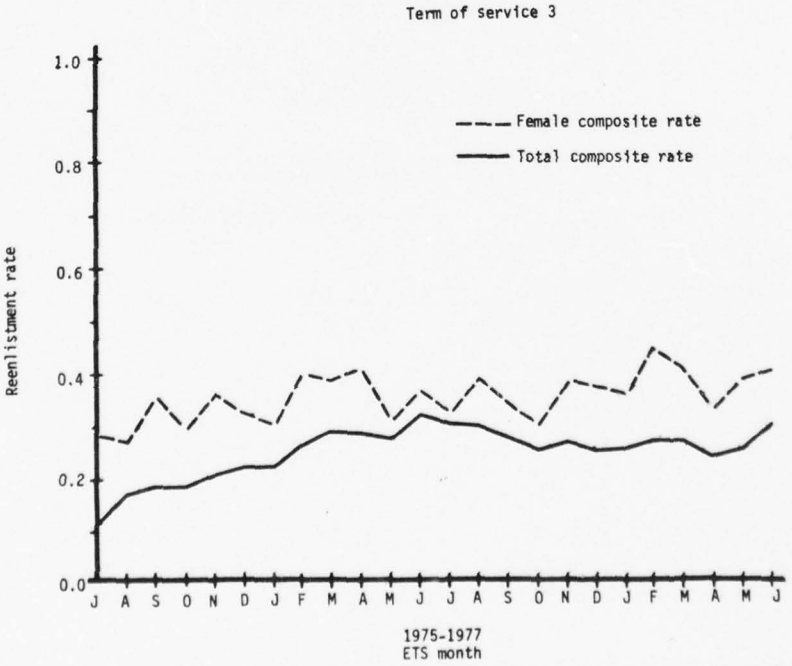

Figure 3-17. Composite Reenlistment Rates vs Female Composite Reenlistment Rates in Cell 3

b. The 21 Months of Completed Service Window. As discussed in paragraph 3-4, the proportion of reenlistments occurring at the soldier's entry into the window represents the occurrence of the largest proportion of reenlistments in the particular cell of interest. This was evident from the Cell 2 reenlistment distributions discussed in paragraph 3-4. To observe the effect of the 21 months of service completed eligibility policy, the reenlistment distributions in Cell 1 (reenlistments occurring more than 12 months prior to ETS) must be analyzed, because for the three-year TOS group, 21 months of service equals 15 months prior to ETS and for the four-year TOS group, 27 months prior to ETS. For each of the accession year/TOS groups examined, a large number of reenlistments did occur at the 15 months prior to ETS mark for three-year termers and at the 27 months prior to ETS mark for four-year termers. Figure 3-18 shows the proportion of reenlistment values in Cell 1 for three-year termers. The FY 73/3 TOS group could have reenlisted under this policy and were also restricted by the 90-day window as they approached their ETS month. The FY 74 group shows the same general pattern as the FY 73 group except that the proportions are less in the 15-13 months to ETS area. This occurrence can be explained by the fact that all of the FY 74 group did not reach the reenlistment eligibility point before the 90-day window policy became effective.

c. The 90- and 180-day Reenlistment Window

(1) Figures 3-4 and 3-5 introduced in paragraph 3-4 illustrated the effects of the 90- and 180-day windows that were reflected in the 1-RPM data base. There is some noise in those figures that is caused by the year/TOS group being affected by both windows. To obtain a better picture of how the reenlistments are spread within the 90- and 180-day windows, the reenlistment distributions of certain months that were covered by only one of the policies were analyzed. The first area of interest was to compare the distribution of reenlistments in the 90-day window for three-year termers versus four-year termers. As shown by Figure 3-19, the pattern of the proportion of reenlistments is very similar for the two TOS groups. By comparing the spread of reenlistments in the 90-day window versus the 180-day window (Figure 3-20), a similar distribution of reenlistments within the two windows can be observed. This similarity in the distribution of the reenlistments in the two windows could be used to provide insights into determining reenlistment distributions for proposed policy changes.

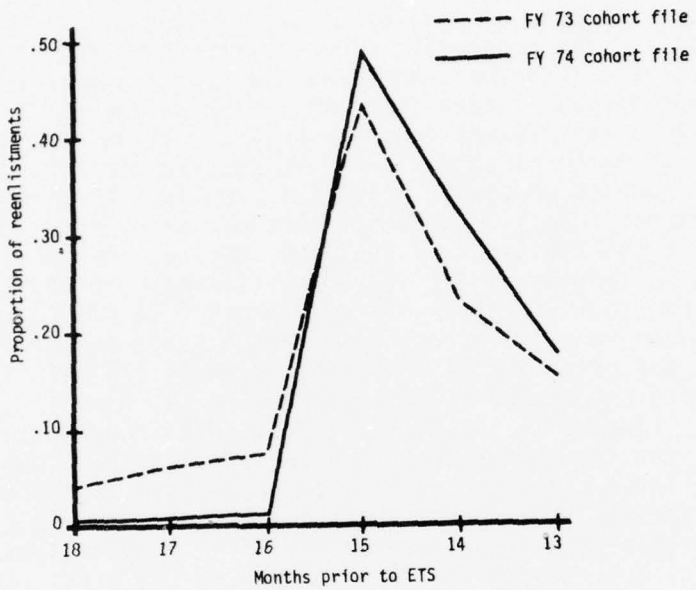

Figure 3-18. Distribution of Reenlistments for Three-year TOS in Cell 1

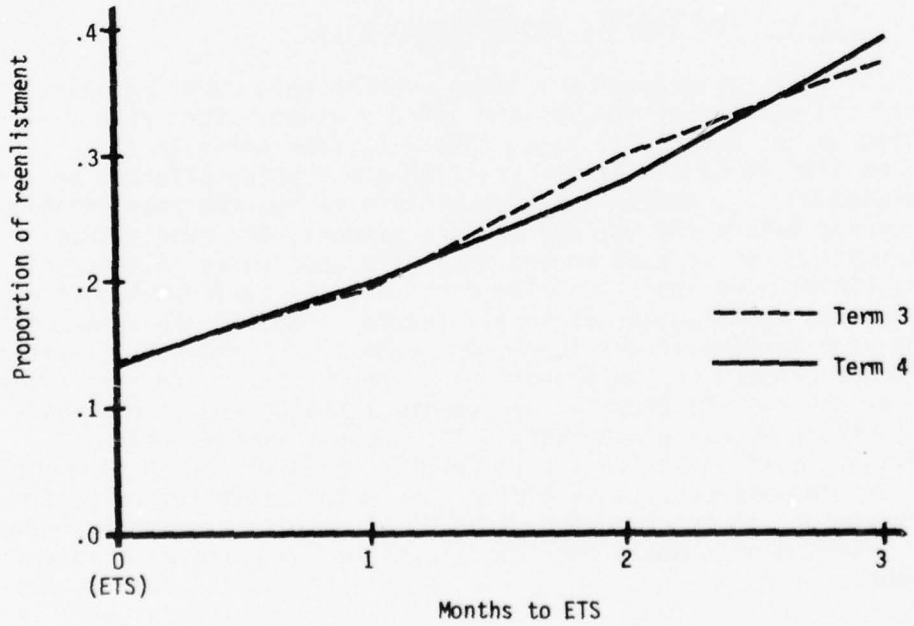

Figure 3-19. Distribution of Reenlistments in 90-day Window, Term 3 vs Term 4

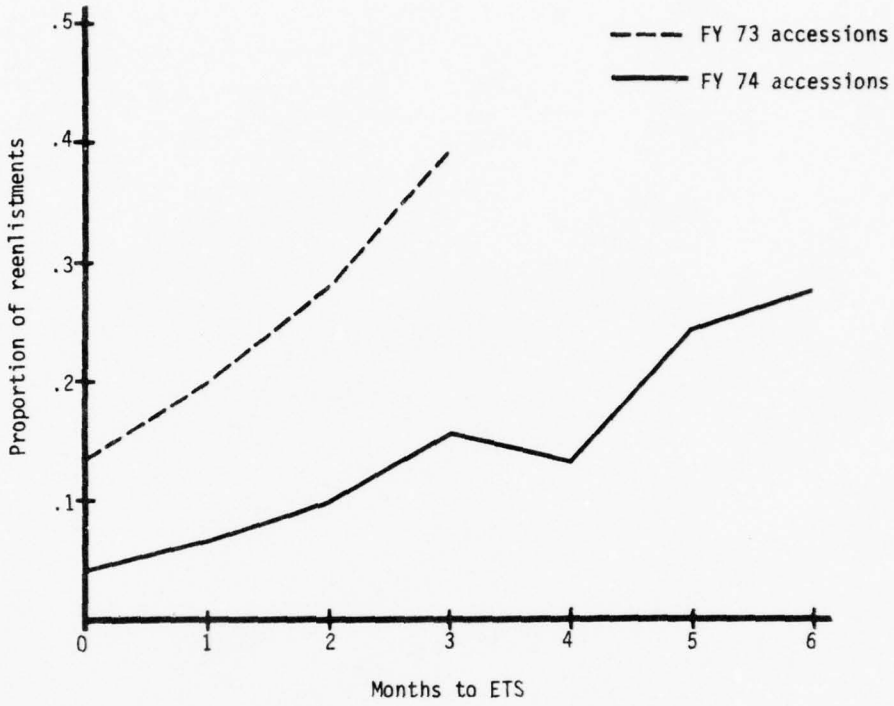

Figure 3-20. Distribution of Reenlistments in 90-day Window vs 180-day Window

3-7. SUMMARY. This chapter discussed the computation of the separation distributions, reenlistment distributions, and reenlistment rates that are required in the 1-RPM forecast methodology. The separation distributions quantified some patterns of separations with the magnitude of extensions of particular note (i.e., the proportion of separations in Cells 3 and 4). The reenlistment distributions are used in the forecasting model to determine how many reenlistments (from a predicted total number of reenlistments for the cell under consideration) will occur in each month. The reenlistment distributions are important since, not only must the number of reenlistments be estimated, but the month in which the reenlistments will occur, i.e., the timing of the reenlistments, must be determined by the forecasting model. The reenlistment rates computed by subpopulation demonstrated that the reenlistment rates vary among the subpopulations and that a composite rate does not accurately portray reenlistment behavior. The effects of policy changes were observed in the historical data.

CHAPTER 4

APPLICATION OF FORECASTING METHODOLOGY

4-1. GENERAL. The purpose of the 1-RPM forecasting methodology is to project reenlistments for 1-12 months into the future. The total reenlistments for the projection year are developed from three separate groups of ETS eligibles according to whether their ETS date is one year before the projection year, during the projection year, or one year after the projection year. In order to reenlist during the projection year, some personnel are projected to reenlist by extending for as long as 23 months while other personnel may reenlist as many as 23 months prior to their initial ETS. This chapter discusses the methodology employed by the model to estimate the amount of reenlistments by month for the projection year from each of the three ETS eligibility groups. Validation of the model was performed by predicting reenlistments for a FY 77 test year (Jul 76 - Jun 77). A technique for modeling certain policy changes and analyzing their impact on reenlistments was also developed and tested.

4-2. DESCRIPTION OF FORECASTING METHODOLOGY

a. The forecasting methodology involves a systematic and repetitive process of predicting the number of separations, computing the number of reenlistments, and distributing those reenlistments over time. This process is the same for each term of service (TOS), subpopulation, and ETS date.

b. The computation of the number of reenlistments can be represented by a four-step process using matrix algebra techniques.

Step 1: Distribute the Quantity of ETS Eligibles Among the Four Cells Using the Separation Distributions. Let q be equal to the quantity of ETS eligibles and let S be a 4 x 1 matrix of separation distributions by cell, then the product qS is the quantity of separations in each cell. This operation can be represented as follows:

$$qS = q \begin{pmatrix} s_1 \\ s_2 \\ s_3 \\ s_4 \end{pmatrix} = \begin{pmatrix} qs_1 \\ qs_2 \\ qs_3 \\ qs_4 \end{pmatrix}$$

where s_i is the proportion of separations in cell i and qs_i is the quantity of separations occurring in cell i.

Step 2. Compute the Number of Reenlistments for Each Cell. The number of reenlistments that will occur in each cell is computed by multiplying the number of separations in each cell by the reenlistment rate for that cell. For notational purposes let the matrix X be a 4 x 4 matrix of reenlistment rates such that x_{ij} equals the reenlistment rate for cell i for i = j and x_{ij} equals zero for $i \neq j$. Letting r_i equal the reenlistment rate for cell i, then $x_{ij} = r_i$ for i = j. Similarly let Y be a 4 x 4 matrix of separations such that y_{ij} equals the quantity of separations in cell i for i = j and y_{ij} equals zero for $i \neq j$. Therefore, $y_{ij} = qs_i$ (calculated in Step 1) for i = j. If the matrix Z is the matrix of reenlistments in each cell, then XY = Z. This matrix product is represented as:

$$XY = \begin{pmatrix} r_1 & 0 & 0 & 0 \\ 0 & r_2 & 0 & 0 \\ 0 & 0 & r_3 & 0 \\ 0 & 0 & 0 & r_4 \end{pmatrix} \begin{pmatrix} qs_1 & 0 & 0 & 0 \\ 0 & qs_2 & 0 & 0 \\ 0 & 0 & qs_3 & 0 \\ 0 & 0 & 0 & qs_4 \end{pmatrix} = \begin{pmatrix} qs_1r_1 & 0 & 0 & 0 \\ 0 & qs_2r_2 & 0 & 0 \\ 0 & 0 & qs_3r_3 & 0 \\ 0 & 0 & 0 & qs_4r_4 \end{pmatrix}$$

Step 3. Distribute the Number of Reenlistments in Each Cell Throughout the Months in that Cell. This step is accomplished by multiplying the number of reenlistments in each cell by the reenlistment distribution for that cell. Let D be the matrix of reenlistment distributions such that d_{ij} is the proportion of reenlistments in cell i that occur in month j of the cell. In matrix form, the matrix multiplication is represented as ZD = M where M is a 4 x n matrix of reenlistments in each of the n months of each cell. Therefore,

$$\begin{pmatrix} qs_1r_1 & 0 & 0 & 0 \\ 0 & qs_2r_2 & 0 & 0 \\ 0 & 0 & qs_3r_3 & 0 \\ 0 & 0 & 0 & qs_rr_4 \end{pmatrix} \begin{pmatrix} d_{1,1} & d_{1,2} & \cdots & d_{1,n} \\ d_{2,1} & d_{2,2} & \cdots & d_{2,n} \\ d_{3,1} & d_{3,2} & \cdots & d_{3,n} \\ d_{4,1} & d_{4,2} & \cdots & d_{4,n} \end{pmatrix} =$$

$$\begin{pmatrix} qs_1r_1d_{1,1} & qs_1r_1d_{1,2} & \cdots & qs_1r_1d_{1,n} \\ qs_2r_2d_{2,1} & qs_2r_2d_{2,2} & \cdots & qs_2r_2d_{2,n} \\ qs_3r_3d_{3,1} & qs_3r_3d_{3,2} & \cdots & qs_3r_3d_{3,n} \\ qs_4r_4d_{4,1} & qs_4r_4d_{4,2} & \cdots & qs_4r_4d_{4,n} \end{pmatrix}$$

Step 4. Determine the Calendar Month of Each of the Monthly Reenlistment Projections Contained in Matrix M of Step 3 by Referring to the Time Span Relative to the ETS Date. By the definition of the 4 cells in Chapter 2, the ETS month corresponds to the last month of Cell 2. Cell 2 was defined to contain all separations/reenlistments which occur within a 12-month period prior to the ETS month. Therefore, the projected amount of q which will reenlist in their ETS month corresponds to the entry $qs_2r_2d_{2,n}$ in the last column (last month) of row 2 (Cell 2) of M. Similarly the amount of reenlistments one month after the ETS month is the first entry in the first column of row 3: $qs_3r_3d_{3,1}$. Thus, if the ETS month for the quantity of reenlistments is June 1979, then $qs_3r_3d_{3,1}$ is one month after the ETS month, i.e., July 1979. By comparing the ETS date to the projection date, the cell can be determined by ascertaining how long the individual would have to extend beyond or separate prior to the ETS date to reach the projection date. The number of months either before or beyond the ETS date that the separation would have to occur to reach the projection date determines the appropriate month in the cell to be used.

4-3. EXAMPLE USING FORECASTING METHODOLOGY

a. The forecasting methodology described in the previous paragraph is a straightforward process for projecting the number of reenlistments produced for one month of ETS eligibles. These reenlistments are distributed across 12 months for each of the four cells; therefore each month of ETS eligibles will be distributed across 48 months of time.

b. An example with notional data can be used to illustrate the forecasting methodology. A forecast will be computed given the following information:

(1) Problem. A projection of reenlistments must be made for a 12-month period beginning in July 1977. For this example, one month of ETS eligibles will be processed. (Recall that 3 years of ETS eligible groups for 2 term of service values, 72 groups total, are considered in the 1-RPM model.)

(2) Data Values. The example ETS month of eligibles to be processed will be June 1977. The quantity of ETS eligibles, q, is the number of personnel with an original ETS date of June 1977 who have not separated from the Army as of July 1977. (Recall that a reenlistment is a separation.) The value of q is determined to be 1000. From the 1-RPM data base the remaining data were extracted where S is the separation distribution vector, R is the reenlistment rate vector, and D is the matrix of reenlistment distributions.

$$S = \begin{pmatrix} .1 \\ .5 \\ .3 \\ .1 \end{pmatrix}, \quad R = \begin{pmatrix} .1 \\ .2 \\ .3 \\ .4 \end{pmatrix} \text{ and}$$

$$D = \begin{pmatrix} .05 & .10 & .10 & .05 & .10 & .10 & .05 & .10 & .05 & .05 & .10 & .10 \\ .05 & .05 & .05 & .05 & .05 & .05 & .05 & .05 & .25 & .20 & .10 & .05 \\ .10 & .10 & .05 & .05 & .05 & .05 & .10 & .10 & .15 & .10 & .05 & .10 \\ .10 & .10 & .10 & .10 & .10 & .05 & .05 & .10 & .10 & .10 & .05 & .05 \end{pmatrix}$$

(3) Solution. To solve this problem, the ETS date must be compared to the first month of the projection period to determine which cell in the separation distribution that the ETS date is in relative to the first month of the projection period. Since July 1977 is later in time than June 1977, this means that anyone who had an initial ETS date of June 1977 and had not separated by July 1977 would have extended for one month or more. Recalling our cell definitions from Chapter 2, Cells 3 and 4 contain all extensions with Cell 3 containing extensions for 1 to 12 months beyond their initial ETS date. Realizing that q reflects only people in Cells 3 and 4, the separation distributions must be modified such that $s_1 = s_2 = 0$ and new s_3 and s_4 values must be computed which add to one and maintain the same s_3 to s_4 ratio as the previous values. Therefore, the separation distribution vector becomes:

$$S = \begin{pmatrix} 0 \\ 0 \\ .75 \\ .25 \end{pmatrix}$$

Although the answer to our problem could be obtained by directly applying the matrix of reenlistments, M, as derived in paragraph 4-2, the step by step process for obtaining those values will be more illustrative.

Step 1. Distribute the eligibles into the appropriate cells by multiplying q by the separation distribution vector.

$$qS = (1000) \begin{pmatrix} 0 \\ 0 \\ .75 \\ .25 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 750 \\ 250 \end{pmatrix}$$

Step 2. Compute the number of reenlistments by multiplying the reenlistment rate times the ETS eligibles. This step was represented by XY = Z in paragraph 4-2.

$$\begin{pmatrix} .1 & 0 & 0 & 0 \\ 0 & .2 & 0 & 0 \\ 0 & 0 & .3 & 0 \\ 0 & 0 & 0 & .4 \end{pmatrix} \begin{pmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 750 & 0 \\ 0 & 0 & 0 & 250 \end{pmatrix} = \begin{pmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 225 & 0 \\ 0 & 0 & 0 & 100 \end{pmatrix}$$

Step 3. This step distributes the reenlistments across the months in each of the cells. The distributive process is accomplished by the matrix product of the reenlistments and the reenlistment distribution matrix. This step was represented as ZD = M in paragraph 4-2.

$$\begin{pmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 225 & 0 \\ 0 & 0 & 0 & 100 \end{pmatrix} \begin{pmatrix} .05 & .10 & .10 & .05 & .10 & .10 & .05 & .10 & .05 & .05 & .10 & .10 \\ .05 & .05 & .05 & .05 & .05 & .05 & .05 & .05 & .25 & .20 & .10 & .05 \\ .10 & .10 & .05 & .05 & .05 & .05 & .10 & .10 & .15 & .10 & .05 & .10 \\ .10 & .10 & .10 & .10 & .10 & .05 & .05 & .10 & .10 & .10 & .05 & .05 \end{pmatrix} =$$

$$\begin{pmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 22.5 & 22.5 & 11.2 & 11.2 & 11.2 & 11.2 & 22.5 & 22.5 & 33.8 & 22.5 & 11.2 & 22.5 \\ 10 & 10 & 10 & 10 & 10 & 5 & 5 & 10 & 10 & 10 & 5 & 5 \end{pmatrix}$$

The matrix M contains the number of reenlistments predicted to occur in each month of each cell. Thus each element of M, m_{ij} is the number of reenlistments that will occur in the jth month of cell i.

Step 4. To complete the solution of this problem, the number of reenlistments must be matched to the appropriate month in the projection period. As discussed in Step 1, ETS eligibles from Jun 77, would have to extend for at least one month to get to Jul 77. Therefore the number of reenlistments forecast for July would be in the 3d (Cell 3) row of M, and one month into that cell, or j = 1. Thus the predicted reenlistments for the period Jul 77 through Jun 78 would be:

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Element of M	3,1	3,2	3,3	3,4	3,5	3,6	3,7	3,8	3,9	3,10	3,11	3,12
Number of reenlistments	22.5	22.5	33.8	11.2	11.2	11.2	22.5	22.5	11.2	22.5	11.2	22.5

c. In the above example, the reenlistment projection was computed for each month in the projection period but only for the contributions from one ETS month, one term of service, and one subpopulation. The 1-RPM methodology considers three year groups, 12 months in each group, for 2 TOS categories, and 24 subpopulations. Therefore, the total number of reenlistments for one month in the projection period would be the sum of 1728 (12 months x 3 years x 2 TOS x 24 subpopulations) values.

4-4. MODEL VALIDATION AT AGGREGATE AND MOS LEVEL. Validation of the 1-RPM forecast model was accomplished at the aggregate and MOS level by predicting reenlistments for a test year and comparing results with the actual reenlistments that occurred during the same period. A comparison was also made of the results from the 1-RPM Model and the results of using an aggregate rate as the current method.

a. Design of Validation Test

(1) The two cohort files available for this study placed some restrictions on the time period which could be used for validation. As shown in Figure 4-1, the period Jul 76 - Jun 77 provides an opportunity to examine the reenlistments for one year of a three- and four-year ETS group. The 1-RPM forecasting model used rates and distributions computed from the FY 73/74 cohort files to predict reenlistments for the test period. Current fiscal years run from October through September; therefore, for this report, the period Jul 76 - Jun 77 will be referred to as a test FY 77.

Cohort file	Jul 75 → Jun 76	Jul 76 → Jun 77	Jul 77 → Jun 78
FY 73	Three-year TOS	Four-year TOS	
FY 74		Three-year TOS	Four-year TOS

Figure 4-1. Initial ETS Dates Available in 1-RPM Data Base

(2) To test the model for this test FY 77, the 1-RPM data base was queried to build a snapshot of the Army's first term three- and four-year force as of the end of Jun 76. Each record in the data base was examined to determine the soldier's active duty status as of Jun 76. Any record indicating a separation date prior to and including Jun 76 was not counted. If the soldier was on active duty after that time, the initial ETS date was computed and the record was tallied into one of the three ETS year groups required by the model. As mentioned in paragraph 4-1, the three year groups consisted of personnel with ETS dates in the year prior to the projection year, in the projection year, and in the year after the projection year. Each record was then recorded by TOS, ETS month, and subpopulation. If the record indicated that a reenlistment had occurred in the test FY 77, a tally was made by year group, TOS, ETS month, and subpopulation. This reenlistment

count is the actual number of reenlistments during the test year and thus will be used as a base of comparison for the 1-RPM Model results.

(3) Because of the large number of MOS represented in the 1-RPM data base, the validation test consisted of a comparison of results for the aggregate level and for 11 MOS. The MOS were chosen by selecting the seven largest MOS and then randomly selecting four more.

(4) Using a method described by the Recruitment and Reenlistment Division of ODCSPER, a historical aggregate first term reenlistment rate for the test FY 77 was computed. The aggregate rate was computed by dividing the number of first term reenlistments that occurred in FY 77 by the number of ETS eligibles in FY 77. The ETS eligibles included all personnel with ETS dates in FY 77 and the number of reenlistments in FY 77 of personnel with ETS dates not in FY 77. This aggregate rate was determined to be .2215, and this rate was used to make the ODCSPER prediction.

b. Results of Validation Test

(1) A comparison of the predicted reenlistment using the 1-RPM Model and the ODCSPER method was accomplished by using the actual number of reenlistments for the test year as a base. Table 4-1 contains the comparison of the results. The 1-RPM Model forecasts represent approximately a 50-60 percent reduction in forecasting error when compared to the use of an aggregate rate currently used in forecasting. As shown in Table 4-1, the 1-RPM projection at the Army-wide level represents approximately a 50 percent reduction in error over the current (ODCSPER) method. At the MOS composite level, the 1-RPM projection reduced the forecast error by over 60 percent. Both methods underestimate reenlistments for some MOS and overestimate for other MOS. The largest error in forecasting using the 1-RPM was for MOS 98G; in fact, the error for each of the other 10 MOS was less than 11 percent. Of note also is the fact that the current method had a much smaller projection error than the 1-RPM projection for MOS 98G.

(2) A chi-square test was performed on the results of the two methods to determine if there was a statistical significance between the forecasts made by the two methods. The test determined that there is a highly significant difference in the two methods at the $\alpha = 0.001$ level.

Table 4-1. Comparison of First Term Reenlistment Forecasts

Level	(1) Actual reenlistments	(2) 1-RPM prediction	(3) Difference (column 2-1)	(4) 1-RPM percent error from actual	(5) ODCSPER prediction	(6) Difference (column 5-1)	(7) ODCSPER percent error from actual
Army-wide	17,807	17,520	-287	-1.6	17,223	-583	-3.3
MOS							
11B (Infantryman)	1,932	1,888	-44	-2.3	1,607	-325	-17.8
13B (FA Crewman)	788	817	29	3.7	741	-47	-6.0
76Y (Unit Supply Clerk)	1,006	897	-109	-10.8	838	-155	-15.4
95B (Military Police)	768	703	-65	-8.5	794	26	3.4
63B (Mechanic)	629	625	-4	-.6	649	20	3.2
71B (Clerk-typist)	771	686	-85	-11.0	578	-193	-25.0
64C (Motor Transport Operator)	431	456	25	5.8	454	23	5.3
98G (Signal Operator)	68	96	28	41.1	82	14	20.6
91C (Clinical Specialist)	156	140	-16	-10.2	112	-44	-28.2
76V (Storage Supplyman)	67	64	-3	-4.5	61	-6	-9.0
71D (Legal Clerk)	34	38	4	11.8	31	-3	-8.8
MOS composite	6,650	6,410	-240	-3.6	5,947	-703	-10.6

4-5. INTEGRATING POLICY EFFECTS INTO THE 1-RPM MODEL. Policy changes which could affect the reenlistment projections could be analyzed by modifying model inputs to reflect the policy changes.

a. Separation Distributions. The separation distributions would be influenced by separation policy changes and by reenlistment policy changes. Although a separation policy change may or may not cause changes in the reenlistment rates, the distribution of separations would be shifted so as to produce a change in the timing of separations. The timing of separations relates to when a separation occurs relative to the ETS date which also could change the timing of reenlistments. For example, consider a new separation/reenlistment policy which would allow no reenlistments more than 12 months prior to ETS. This change would produce a change in both the reenlistment rates and a separation distribution. The reenlistment rates for that time period prior to 12 months to ETS would change--they would be equal to zero. The separations in that time period would then reflect separations for all reasons except for reenlistment. The other time periods would be modified to reflect this shift.

b. Reenlistment Distribution. A reenlistment policy change modifying when a reenlistment can occur relative to a soldier's ETS could be modeled by the 1-RPM Model in the form of modified reenlistment distributions. As discussed in paragraph 3-6, the expansion of the reenlistment window produced a change in the reenlistment distributions. The shift in reenlistment distributions brought about by this policy change also provided some insight into how a future change in the reenlistment window might be modeled. For example, as observed in Chapter 3, the shapes of the reenlistment distribution curves for the 90- and 180-day windows were very similar, which provided an insight as to the distribution of reenlistments, if the window was changed to some point between 90 and 180 days.

c. Reenlistment Rates. The reenlistment rates for any time period are basically the number of reenlistments in that time period divided by the number of separations for that same period. Therefore, any policy change that affects the separation distributions and/or reenlistment distributions could alter the reenlistment rates.

d. Subpopulation ETS Eligibles. The effects of enlistment/reenlistment policies that alter the number of ETS eligibles within any given subpopulations could be analyzed by the 1-RPM Model. The modified number of ETS eligibles by subpopulation could serve as inputs to the model and the model results could be evaluated to determine the future effect on the Army's total reenlistment picture.

e. Sensitivity Analysis

(1) The 1-RPM Model is a tool which can be used to analyze certain policy changes and also to study the impact of changing subpopulation sizes. Because the 1-RPM methodology captures reenlistment behavior by demographics, any variation in the demographic composition of the Army can be analyzed in terms of reenlistment projections. These variations could be reflective of Army enlistment or reenlistment policy as well as any trends in the enlistment eligible populations. To illustrate the sensitivity of the 1-RPM Model to variations in subpopulation sizes, two special cases were examined using the ETS eligible profiles generated for use in the validation test (see paragraph 4-4).

(2) Using the results of the validation test as a base, the subpopulation ETS eligible populations were modified to model the two cases. The first case assumed that all accessions for FY 73 and FY 74 were high school graduates. To model this case required that the number of ETS eligibles for the non-high school graduate subpopulation be added to the number of ETS eligibles for the corresponding high school graduate subpopulations. For example the number of ETS eligibles for the male, higher pay grade, white, young and non-high school graduate subpopulation was added to the number of ETS eligibles for the male, higher pay grade, white, young and high school graduate subpopulation. The overall total of ETS eligibles did not change. In Chapter 3, a general observation was made that the reenlistment rates for the high school graduate subpopulations were generally higher than the rates for the non-high school graduate subpopulations. The model results produced a 1.1 percent decrease in total number of reenlistments. Although the composite reenlistment rate for high school graduates is higher than the composite rate for non-high school graduates, this is not true at the subpopulation level. For example, in the male, higher pay grade, white and young groups, the non-high school graduate rate is more than 3 percent higher than the rate for the high school graduate group. Although 3 percent is a relatively small difference, when applied to these, the largest subpopulations, a difference of over 350 reenlistments can be observed.

(3) The second case was to assume that all ETS eligibles were in the higher pay grades. As was done for the first case, the number of ETS eligibles for the lower pay grade subpopulations was added to the number of ETS eligibles for their corresponding higher pay grade subpopulations. The overall total of ETS eligibles remained unchanged. In Chapter 3, the reenlistment rates for the higher pay grade were significantly higher than the reenlistment rates for the lower pay grades. In some instances the rates

were four to five times higher. The 1-RPM Model results indicated a 43 percent increase in the number of reenlistments over the base case.

(4) The results of these two special cases illustrated the advantage of using subpopulation rates versus using aggregated rates. For example, for the first case, the reenlistment rates aggregated at the education levels would indicate that high school graduates reenlist at a higher rate than non-high school graduates. Thus, if an aggregated rate were used to develop a projection, an increase in reenlistments would be forecast. As the model results illustrated, an increase in the number of reenlistments would not occur, but actually there would be a small decrease in the total number of reenlistments.

4-6. SUMMARY. Realizing that only a small proportion of the Army reenlistments occur at a soldier's initial ETS date, the 1-RPM Model provides a methodology for forecasting reenlistments over time relative to the initial ETS date. By predicting reenlistments for personnel reenlisting prior to, during, and beyond their initial ETS date, the 1-RPM Model is a significant improvement over current reenlistment forecasting methods which forecast at the aggregate level and provide limited vehicles for analyzing policy changes. The 1-RPM Model also permits the modeling of changes in reenlistment/separation policies which could provide insights into determining if the policy change would produce the desired results.

CHAPTER 5

EFFECT OF EXOGENOUS VARIABLES

5-1. GENERAL. Three exogenous variables were analyzed to determine their effect on subpopulation reenlistment rates occurring in Cell 2 (reenlistments occurring from 12 to 0 months prior to ETS). Being the largest cell, Cell 2 should reflect the effects of the exogenous variables. The exogenous variables which were felt to have the greatest impact on reenlistment behavior were unemployment rate, the Consumer Price Index (CPI) and the military pay to civilian pay ratio (MP/CP). The unemployment rate data was obtained from Bureau of Labor Statistics Reports.[2] The categories of unemployment rate data were matched as closely as possible to the 1-RPM subpopulation definition (see Table F-2). The Department of Commerce[3] CPI values used in this analysis were the proportionate changes from month to month and not the actual CPI values. A soldier is likely to be influenced by the relative changes in the CPI and not by the actual CPI values. The military earnings figures were obtained from the Army Force Planning Cost Handbook,[4] and the civilian earnings information was extracted from Bureau of Labor Statistics Reports.[1]

5-2. PURPOSE OF ANALYSIS. The purpose of the analysis was to search for relationships between the selected exogenous influences and the subpopulation reenlistment rates from the 1-RPM data base. The exogenous variables for a given time period (month) were first examined for a relationship with the same time period of each subpopulation reenlistment rate. Since exogenous variables from a previous time period may affect the reenlistment rates at some later time period, the exogenous variables were also lagged from one to six months, i.e., the effects of exogenous variables for time periods of one to six months prior to the month of the reenlistment rate. Correlation analysis was used to identify possible linear relationships between the exogenous variables and the subpopulation reenlistment rates. Using these identified relationships, an attempt was made to develop a regression equation to predict the effect of the exogenous variables on the reenlistment rates.

5-3. CORRELATION ANALYSIS OF EXOGENOUS VARIABLES

a. Procedures. Correlation analysis is a statistical technique used to determine whether or not a linear relationship exists between two sets of variables. The three exogenous variables were examined for a relationship with the same time period of each reenlistment rate and were also lagged from one to six months. A

lag means that the observation from an earlier month is aligned with the current reenlistment rate. For example, if CPI is lagged two months, this means that the CPI value from two months prior is aligned with the current reenlistment rate.

b. Observations. The results of the complete correlation analysis are shown in Table E-1 for personnel with a three-year term of service (TOS) and in Table E-2 for personnel with a four-year TOS. Contained in Tables E-1 and E-2 are the computed correlation coefficients which quantify the extent to which a linear relationship exists between sets of variables. A zero (0.0) indicates no relationship, and a one (1.0) indicates a perfect relationship. In general, most correlation coefficients were small. However, some observations that were worthy of note are discussed below:

(1) The lower pay grade categories had more negative correlation coefficients than the higher pay grade group. This fact tends to indicate that when an exogenous variable increases, the subpopulation reenlistment rate decreases, and vice versa. For example, when the unemployment rate is high, the subpopulation reenlistment rate is low for the lower pay grade groups. Since this type of relationship defies intuition, the results were interpreted to mean that the exogenous variables had very little influence on the reenlistment rates for the lower pay grades.

(2) The three-year TOS, high pay grade subpopulations correlation with MP/CP was highest with a lag of five months for all eight subpopulations. The correlation coefficients ranged from 0.44 to 0.68. These correlation coefficients are statistically different from zero at the $\alpha = 0.05$ level of significance, indicating that there is a linear relationship. However, the relationship is not very strong, i.e., less than 50 percent of the variation is explained. No explanation for this can be given; however, it is clear that this was not a random phenomenon.

(3) The four-year TOS, low pay grade subpopulations had correlation coefficients ranging from 0.32 to 0.56 for MP/CP with zero month lag for all seven subpopulations (one subpopulation had a reenlistment rate of zero and therefore was excluded from the analysis). Four of the seven correlation coefficients were statistically different from zero at the $\alpha = 0.05$ level.

5-4. REGRESSION ANALYSIS OF EXOGENOUS VARIABLES. Regression analysis is a statistical technique used to relate a set of independent variables with a dependent variable. The exogenous variables were the independent variables, and the reenlistment rates were the dependent variables. Various forms of the regression

equation were fitted, including the untransformed variables, a log transformation (logistics model), and lagged variables. No "good fits" were obtained for any of the trials. The highest R^2 obtained was equal to 0.49 which means that only 49 percent of the variation in reenlistment rates was explained by the regression equation.

5-5. SUMMARY. Although several interesting observations were noted, the correlation and regression analysis did not lead to any usable predictive equation for forecasting reenlistment rates for the subpopulations. The unmodified historical reenlistment rates should be used in future applications of the forecasting methodology until such a time when useful exogenous variable predictive equations might be found.

CHAPTER 6

OBSERVATIONS

6-1. INTRODUCTION. The First Term Reenlistment Projection by Military Occupational Specialty (1-RPM) Study analyzed the reenlistment behavior of first term soldiers and developed a forecasting method that will assist personnel managers in focusing and applying accession and retention programs at the military occupational specialty (MOS) and Army level. The reenlistment behavior of FY 73 and FY 74 accessions to the Army was used to study the influence of reenlistment policy changes and to analyze reenlistment/separation patterns.

6-2. ESSENTIAL ELEMENTS OF ANALYSIS. Listed below are the essential elements of analysis (EEA) from the 1-RPM study directive and the applicable 1-RPM study results which are responsive to the EEA.

a. "What variables external to the Army influence first term reenlistment behavior? Can the effects of the variables be quantified?" The most important factors influencing behavior of FY 73 and FY 74 accessions (soldiers whose reenlistment decisions would occur in FY 76, 77, and 78) were pay grade, race, education, term of service, sex, and age. In analyzing the reenlistment rates for personnel who reenlist/separate within one year prior to their initial ETS date, behavioral patterns could be correlated with these factors. The analysis of the effects of three exogenous variables did not yield any significant correlations.

b. "What Army policies influence reenlistment behavior? Can the effect of these policies be quantified?" The 1-RPM Study examined separation and reenlistment patterns exhibited by FY 73 and FY 74 accessions. The effects of Army policies that altered the time at which a reenlistment can occur were observed in the historical data. The changing of the reenlistment window produced changes in the reenlistment distributions that could provide valuable insights in quantifying any future changes in the reenlistment window.

c. "Can existing data and data structures be used to develop reenlistment forecasts at the MOS level that interface with the ELIM-COMPLIP Models?" No. A new Army personnel data base is currently under development which will permit the tracking of reenlistment and separation behavior at the MOS level. The current Army personnel data system maintains the present MOS for each individual but contains no MOS history for the individual. As an

abstract from the current personnel data system, the 1-RPM data base does not contain sufficient information for tracking MOS patterns for any period of time. The differing levels of aggregation and methodological differences prohibit interfacing of the two models. The 1-RPM data base provides information for forecasting in the very near term, 1 to 12 months, but does not provide sufficient data for forecasting one to five years into the future as required by the ELIM-COMPLIP Model.

d. "What kind of personnel policies can be quantified and integrated into MOS forecasting?" One of the key inputs into the forecasting model is the subpopulation, or demographic, composition of the ETS eligibles for a given period of time. A personnel policy, either at the MOS or Army level, that would modify the subpopulation profiles could be analyzed by comparing the results of the reenlistment forecasts under the conditions of new policy to the results of the reenlistment forecasts under the current policy. An example of this would be a new policy that for some reason required all reenlistment eligibles to be high school graduates. The effects of this policy change, be it at the MOS or Army level, could be examined by setting equal to zero the reenlistment rates of all subpopulations that contain non-high school graduates and making a new forecast. The results of the new forecast could be compared to the forecast based on current policy to determine the effects of the policy change on near term reenlistments.

6-3. OBSERVATIONS. The major observations resulting from this study of the reenlistment process are as follows:

a. The 1-RPM forecasting methodology provides a significant improvement in reenlistment projections when compared to current methods.

(1) This improvement is attributed to the use of subpopulation reenlistment rates and to the importance of the time dimension.

(2) Sensitivity analysis conducted as part of the study effort illustrated the advantage of using subpopulation reenlistment rates rather than aggregate rates.

b. It is not enough to predict the number of reenlistments. The most critical problem is to determine when the reenlistments will occur.

(1) Although the historical data reflects that the majority of reenlistments occur prior to a soldier's initial ETS, between

12 and 18 percent of the reenlistments occurred after the soldier had passed his initial ETS date.

(2) The reenlistment rates for extendees are higher than those rates for separations occurring prior to ETS.

c. The effects of policy changes which altered the size of the reenlistment window can be observed in the historical data. Changing the reenlistment window appears to have influenced when reenlistments occurred relative to an individual's ETS date. The distribution of reenlistments over the period one year prior to the ETS date illustrates the shift of reenlistments caused by the policy change. For example, the largest proportion of reenlistments occurred during the first month of reenlistment eligibility under both the 90- and 180-day reenlistment windows. These observations provide insights into quantifying future changes in the reenlistment window.

d. Analysis of two years of data on the reenlistment rates for three- and four-year term of service enlistees who separate (a reenlistment is a separation) within one year prior to ETS indicates an increase in the rates of reenlistment.

e. The most significant variables as predictors of reenlistment behavior for FY 73 and FY 74 accessions were pay grade, race, education, term of service, sex, and age.

f. The best single discriminator of reenlistment behavior is pay grade. The higher pay grade groups reenlist at a rate four or five times higher than their lower grade counterparts. This reflects the policy requiring that reenlistees must obtain a waiver if their pay grade is not E-4 or above.

g. An analysis of the effects of exogenous variables (unemployment rates, Consumer Price Index, and wage ratios) on reenlistment showed no significant relationship to the reenlistment rates.

APPENDIX A

STUDY CONTRIBUTORS

1. STUDY TEAM

   a. Study Director

      MAJ John E. Johnson, Methodology, Resources and Computation Directorate

   b. Team Members

      Ms Ola C. Berry
      Mr. Jerry Thomas

   c. Other Contributors

      Mr. Leonard S. Freeman
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   d. Support Personnel

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3. EXTERNAL CONTRIBUTORS

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   Ms Virginia Crawford, Personnel Information Systems Directorate, MILPERCEN

APPENDIX B

STUDY DIRECTIVE

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, D.C. 20310

11 JAN 1978

SUBJECT: Tasking Directive - First Term Reenlistment Projection by Military Occupational Specialty (1-RPM)

THRU: Director of the Army Staff
Department of the Army
Washington, D.C. 20310

Deputy Chief of Staff for Operations and Plans
Department of the Army
Washington, D.C. 20310

TO: Commander
US Army Concepts Analysis Agency
8120 Woodmont Avenue
Bethesda, Maryland 20014

1. Purpose: This directive provides for a study to analyze the reenlistment behavior of first term soldiers (soldiers serving their initial enlistment) and to develop a forecasting method that will assist personnel managers in focusing and applying accession and retention programs at the military occupational specialty (MOS) level.

2. Study Title (Category 1, Manpower and Personnel): First term Reenlistment Projection by Military Occupational Specialty (1-RPM).

3. Background:

a. The quantity and quality of first term soldiers entering the career force (soldiers who have reenlisted at least once) influence the first term training requirements necessary to maintain this force. The degree to which personnel managers can monitor, predict and control the reenlistment behavior of first term soldiers directly impacts how effectively the personnel and skill requirements for the career force are met.

b. The Enlisted Loss Inventory Model and Comparison of Manpower Programs Using Linear Programs (ELIM-COMPLIP) Models currently provide managers with reenlistment projections at an aggregated or Army-wide level. The Personnel Inventory Analysis/Year of Service (PIA/YOS) Model provides reenlistment projections at the MOS level. These models are limited in their ability to incorporate the effects of changes in reenlistment patterns or personnel policies. These limitations frequently limit the accuracy of reenlistment projections, particularly at the MOS level, thereby reducing the capability of personnel managers to formulate policies for controlling accessions into the career force by MOS.

SUBJECT: Tasking Directive - First Term Reenlistment Projection by Military Occupational Specialty (1-RPM)

4. Study Sponsor: Office of the Assistant Secretary of the Army (Manpower and Reserve Affairs)-OASA(M&RA).

5. Study Agency: US Army Concepts Analysis Agency (CAA).

6. Terms of Reference:

a. Problem. First term reenlistment trends and the influences of Army policies on these trends are not quantified sufficiently to permit managers to incorporate these trends into current forecasting models or to improve the accuracy of forecasts at the MOS level.

b. Purpose. The 1-RPM study will develop and implement a methodology for projecting first term reenlistments in a manner that:

(1) Improves the quantitative accuracy of reenlistment projections at the MOS level.

(2) Provides an improved capability to formulate and assess policies designed to influence the flow of first term reenlistments.

c. Objectives.

(1) Improve first term reenlistment forecasts at the MOS level by quantifying influences within the reenlistment environment and integrating them into reenlistment projections.

(2) Identify and quantify trends in first term reenlistment behavior in a manner that facilitates the formulation and evaluation of accession and retention policies.

d. Scope. The 1-RPM study will encompass the following areas:

(1) Investigation and analysis of factors influencing first term reenlistment.

(2) Review and analysis of accession and reenlistment policies.

(3) Review and analysis of existing forecasting methods and systems.

(4) Derivation of MOS reenlistment rates.

(5) Sensitivity testing of assumptions and reenlistment variables.

e. Limitations.

(1) The study will develop and analyze reenlistment rates for first term soldiers in their third and fourth years of service.

(2) MOS forecasts will be limited to soldiers entering the fourth and fifth years of service from 1-12 months in the future.

SUBJECT: Tasking Directive - First Term Reenlistment Projection by Military Occupational Specialty (1-RPM)

(3) The study will be limited to address only the feasibility of integrating 1-RPM study results and/or model into the ELIM-COMPLIP and PIA/YOS Models and the RETAIN system.

f. *Constraints.*

(1) The study findings will be available in draft or briefing form on or about 30 July 1978.

(2) The study report will be published by 30 August 1978.

g. *Assumptions.*

(1) The quality of existing FY 77-78 reenlistment data is sufficient to support statistical analysis at the MOS level.

(2) The demographic content of the first term force is a valid basis for predicting reenlistment behavior at the MOS level.

h. Essential Elements of Analysis.

(1) What variables (external to the Army) influence first term reenlistment behavior? Can the effects of these variables be quantified?

(2) What Army policies influence reenlistment behavior? Can the effect of these policies be quantified?

(3) Can existing data and data structures be used to develop reenlistment forecasts at the MOS level that interface with the ELIM-COMPLIP Models?

(4) What kind of personnel policies can be quantified and integrated into MOS forecasting?

7. Responsibilities:

a. ODCSPER will provide information on past, current or proposed enlistment/reenlistment policies designed to influence reenlistments in the period covered by the study effort.

b. MILPERCEN will provide monthly gains/loss and demographic data by MOS and SSN as requested by the study agency.

c. The study effort will require POC in ODCSPER (Recruiting and Retention Division) and MILPERCEN (Enlisted Procedures and Force Management Division, Military Strength Systems Branch and Analysis and Computations Branch).

CAA-SR-79-5

SUBJECT: Tasking Directive - First Term Reenlistment Projection by Military Occupational Specialty (1-RPM)

8. Literature Search:

a. ODCSPER and MILPERCEN have responsibility for and interest in portions of the 1-RPM study.

b. The studies and/or literature listed at Inclosure 2 should be examined during the research effort.

9. References: Administrative and procedural (ARs) (AR 601-280 and DA Cir 611-56).

10. Administrative:

a. Support.

(1) ADP resources required to extract FY 77/78 reenlistment data will be provided by MILPERCEN.

(2) ADP resources required to support analysis and derivation of MOS reenlistment rates and forecasts will be provided by CAA.

b. Milestones. See Inclosure 1. Delivery of final report, 30 August 1978.

c. Control Procedures. The study sponsor will provide instructions for the establishment of a Study Advisory Group.

d. Action Document. A final study report will be prepared. Computer-based models developed as a result of this study will be documented.

2 Incl
as

Paul D. Phillips
Deputy Assistant Secretary of the Army
(Manpower and Reserve Affairs)

STUDY SCHEDULE

1.	Collect FY 77 reenlistment and demographic data and establish monthly data collection format for FY 78 data	End January
2.	Identify and quantify reenlistment variables	End February
3.	Develop subpopulation reenlistment rates and initial MOS forecasts. Incorporate unemployment and seasonal influences	Mid May
4.	Perform sensitivity and statistical testing of subpopulation reenlistment rates	End May
5.	Refine subpopulation reenlistment rates using current FY 78 reenlistment data	End June
6.	Policy analysis	End June
7.	Develop MOS forecasts for 1-12 months into the future	End July
8.	Deliver final report and documentation to the study sponsor	End August
9.	Documentation and transfer (if required) computer-based model	End September

Inclosure 1

LITERATURE SEARCH MATERIAL

1. ELIM-COMPLIP System Documentation Volumes I-IV

2. Job Satisfaction/Reenlistment Intent Analysis (Feb 77), unpublished, MILPERCEN (DAPC-MSP-D)

3. Attitudes and Motivations of First Termers Toward Reenlistment, N. W. Ayer, ABH International Market Research Department, January 1976

4. Impact of Declining Medical Services on Recruiting and Retention, MILPERCEN Survey, Mar 77 (Report Nr 77-18-3)

5. Cost Effectiveness Analysis of Bonus and Reenlistment Policies, US Army Concepts Analysis Agency, August 1977

6. Numerous Occupational Survey Reports of Various MOS, published by US Army Military Personnel Center (DAPC-MSP-D)

Inclosure 2

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, D.C. 20310

11 AUG 1978

SUBJECT: First Term Reenlistment Projection by Military Occupational Specialty (1-RPM) Study - Modification of Tasking Directive

THRU: Director of the ~~Army Staff~~ by 15 Aug 78
Department of the Army
Washington, D.C. 20310

Deputy Chief of Staff for Operations and Plans 15 Aug 78
Department of the Army
Washington, D.C. 20310

TO: Commander
US Army Concepts Analysis Agency
8120 Woodmont Avenue
Bethesda, Maryland 20014

1. Reference letter, Office of the Assistant Secretary of the Army(M&RA), dated 11 Jan 78, subject: Tasking Directive - First Term Reenlistment Projection by Military Occupational Specialty (1-RPM).

2. The 1-RPM study requires extensive personnel data to permit the analysis and derivation of historical reenlistment rates. It is recognized that the US Army Concepts Analysis Agency has experienced delays in obtaining necessary personnel data. In order to provide adequate time for analysis, the study schedule established by the 1-RPM Tasking Directive (referenced above) is hereby revised.

3. Paragraphs 6f, 10b and Inclosure 1 of the 1-RPM Tasking Directive are modified as follows:

a. The study findings will be available in draft or briefing form on or about 15 November 1978.

72814M

SUBJECT: First Term Reenlistment Projection by Military Occupational Specialty (1-RPM) Study - Modification of Tasking Directive

b. The study report will be published by 15 December 1978.

c. Documentation and transfer (if required) of computer-based model to be completed by 31 January 1979.

Paul D. Phillips
Deputy Assistant Secretary of the Army
(Manpower and Reserve Affairs)

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, D.C. 20310

SUBJECT: First Term Reenlistment Projection by Military Occupational Specialty (1-RPM) Study - Modification of Tasking Directive

THRU: Director of ~~the Army~~ Staff DAMS 21 Dec 78
Department of the Army
Washington, DC 20310

~~Deputy Chief of Staff for Operations and Plans~~ ERC 25 Jan 79
Department of the Army
Washington, DC 20310

TO: Commander
US Army Concepts Analysis Agency
8120 Woodmont Avenue
Bethesda, Maryland 20014

1. References:

a. Letter, Office of the Assistant Secretary of the Army (M&RA), dated 11 Aug 78, subject as above.

b. Letter, Office of the Assistant Secretary of the Army (M&RA), dated 11 Jan 78, subject: Tasking Directive - First Term Reenlistment Projection by Military Occupational Specialty (1-RPM).

2. The US Army Concepts Analysis Agency (CAA) has provided necessary support to ODCSPER in the analysis of proposed changes to the military compensation system. An additional requirement by the DCSPER for CAA to develop a personnel retention model will cause a delay in the 1-RPM study schedule. In order to provide adequate time for analysis, the study schedule is hereby revised.

3. Paragraphs 6f, 10b and Inclosure 1 of the 1-RPM Tasking Directive (reference b) are modified as follows:

a. The study findings will be available in draft or briefing form on or about 15 March 1979.

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SUBJECT: First Term Reenlistment Projection by Military Occupational Specialty (1-RPM) Study - Modification of Tasking Directive

b. The study report will be published by 15 April 1979.

c. Documentation and transfer (if required) of computer-based model will be completed by 31 May 1979.

Paul D. Phillips
Deputy Assistant Secretary of the Army
(Manpower and Reserve Affairs)

APPENDIX C

REFERENCES AND BIBLIOGRAPHY

REFERENCES

1. US Department of Labor, Bureau of Labor Statistics, Employment and Earnings, Table C-1, Gross Hours and Earnings of Production or Nonsupervisory Workers on Private Nonagricultural Payrolls, by Industry Division, 1955 to Date, Washington, DC, July 1976 through August 1978.

2. US Department of Labor, Bureau of Labor Statistics, Table 3A, Employment Status of the Civilian Noninstitutional Population by Age and Sex, (unpublished monthly reports), Washington, DC, July 1975 through June 1978.

3. US Department of Commerce, Bureau of Economic Analysis, Business Conditions Digest, Other Important Economic Measures, Washington, DC, July 1977 and December 1978.

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APPENDIX D

HISTORICAL SEPARATION AND REENLISTMENT BEHAVIOR

D-1. BACKGROUND. This appendix presents the historical separation and reenlistment behavior of FY 73 and FY 74 accessions with three- and four-year TOS. Analysis of this behavior revealed that a significant proportion of this group separated prior to or after their initial ETS date. Therefore, the group's behavior was tracked according to when the reenlistment and/or separation occurred relative to their initial ETS. The following cells were used to identify the time spans in which the separation/reenlistment action occurred.

a. Cell 1 - Actions occurring more than 12 months prior to ETS.

b. Cell 2 - Actions occurring 0-12 months prior to ETS.

c. Cell 3 - Actions occurring 1-12 months beyond ETS.

d. Cell 4 - Actions occurring more than 12 months beyond ETS.

D-2. RESULTS. Tables D-1 through D-37 contain the results of this analysis. For the categories listed below, results are shown for each of the four cells, and for each combination of FY and TOS (except where noted).

a. Separation behavior is presented in Tables D-1 through D-8. Historical separations are shown by ETS month (Tables D-1 and D-2) and for the 24 subpopulations (Tables D-3 and D-4). The distributions of total separations (by ETS month) over the four cells are shown in Tables D-5 through D-8.

b. Reenlistment behavior is shown in Tables D-9 through D-22. Historical reenlistments are presented in Tables D-9 and D-10 by ETS month and are shown by subpopulation in Tables D-11 and D-12. Tables D-13 through D-22 present the proportion of historical reenlistment that occurred in each cell relative to an ETS month. For Cell 2 (Tables D-14 through D-17) and Cell 3 (Tables D-18 through D-21), the reenlistment distributions are displayed for each month of a given FY/TOS combination. For Cell 1 (Table D-13) and Cell 4 (Table D-22), the reenlistment distributions are aggregated at the FY/TOS level.

c. Reenlistment rates are presented in Tables D-23 through D-37.

Table D-1. Separations by ETS Month (FY 73 accessions)

ETS month	FY 73 accessions									
	Three-year term of service					Four-year term of service				
	Cell 1	Cell 2	Cell 3	Cell 4	Total	Cell 1	Cell 2	Cell 3	Cell 4	Total
July	936	6,107	1,447	546	9,036	773	766	207	62	1,808
August	1,114	7,172	1,282	475	10,043	855	824	236	51	1,966
September	1,140	7,734	1,368	386	10,628	803	799	209	31	1,842
October	944	6,067	1,191	279	8,481	726	669	215	19	1,629
November	860	4,719	999	230	6,808	575	551	144	18	1,288
December	766	4,316	751	180	6,013	653	605	145	10	1,413
January	1,181	5,980	1,160	237	8,558	871	740	199	13	1,823
February	749	3,722	723	128	5,322	494	528	121	10	1,153
March	549	2,989	578	99	4,215	365	458	119	6	948
April	389	1,952	403	48	1,792	244	309	66	1	620
May	420	1,940	477	46	2,883	303	607	93	0	1,003
June	972	6,208	1,074	106	8,360	856	2,116	341	0	3,313
Total	10,020	58,906	11,453	2,760	83,139	7,518	8,972	2,095	221	18,806

Table D-2. Separations by ETS Month (FY 74 accessions)

ETS month	FY 74 accessions									
	Three-year term of service					Four-year term of service				
	Cell 1	Cell 2	Cell 3	Cell 4	Total	Cell 1	Cell 2	Cell 3	Cell 4	Total
July	790	5,644	998	100	7,532	259	694	106	0	1,059
August	763	6,031	1,119	82	7,995	304	785	107	0	1,196
September	875	6,236	1,152	83	8,346	255	721	75	0	1,051
October	803	5,341	1,134	61	7,339	198	527	70	0	795
November	812	4,721	938	54	6,525	154	458	59	0	1,466
December	575	3,855	633	36	5,099	152	412	42	0	606
January	946	5,798	1,129	41	7,914	219	618	74	0	911
February	700	4,565	886	34	6,185	205	579	49	0	833
March	652	4,534	766	21	5,973	190	479	44	0	713
April	660	3,999	695	12	5,366	173	408	21	0	602
May	706	4,333	717	9	5,765	166	480	19	0	665
June	1,114	9,422	1,518	0	12,054	454	1,750	0	0	2,204
Total	9,396	64,479	11,685	533	86,093	2,729	7,911	666	0	11,306

Table D-3. Separations by Subpopulation (FY 73 accessions)

Subpopulation	FY 73 accessions									
	Three-year term of service					Four-year term of service				
	Cell 1	Cell 2	Cell 3	Cell 4	Total	Cell 1	Cell 2	Cell 3	Cell 4	Total
1	1,649	3,079	937	132	5,797	1,389	405	161	8	1,963
2	76	99	54	4	233	66	20	11	0	97
3	2,247	4,732	968	233	8,180	1,559	1,501	383	17	3,460
4	190	365	105	29	689	150	106	48	3	307
5	457	1,083	459	53	2,052	377	160	68	5	610
6	53	103	46	8	210	39	19	10	0	68
7	749	1,529	480	98	1,856	512	417	136	8	1,073
8	130	248	87	17	482	102	56	22	1	181
9	609	5,710	969	255	7,543	664	699	188	20	1,571
10	68	304	59	18	449	76	51	8	3	138
11	1,669	27,362	3,854	1,008	33,893	1,435	3,511	596	199	5,553
12	312	3,983	834	190	5,319	291	559	118	10	978
13	147	1,164	337	74	1,722	174	174	64	6	418
14	31	153	34	13	231	27	38	11	2	78
15	436	5,101	1,044	331	6,912	366	890	170	26	1,452
16	100	1,034	263	58	1,455	79	204	44	5	332
17	358	153	37	23	571	108	8	8	0	124
18	87	45	6	13	151	28	12	3	0	43
19	50	62	14	7	133	1	1	0	0	2
20	18	14	10	3	45	4	1	0	0	5
21	371	1,476	465	119	2,431	49	79	20	5	153
22	128	517	183	45	873	13	44	8	2	67
23	50	425	155	20	650	6	12	6	0	24
24	35	165	53	9	262	3	5	1	0	9
Total	10,020	58,906	11,453	2,760	83,139	7,518	8,972	2,095	221	18,806

Table D-4. Separations by Subpopulation (FY 74 accessions)

Subpopulation	FY 74 accessions									
	Three-year term of service					Four-year term of service				
	Cell 1	Cell 2	Cell 3	Cell 4	Total	Cell 1	Cell 2	Cell 3	Cell 4	Total
1	3,074	5,119	1,236	31	9,460	34	28	1	0	63
2	187	283	109	2	581	1	0	1	0	2
3	1,368	5,156	1,127	23	7,674	847	1,675	87	0	2,609
4	161	584	274	2	1,021	150	317	12	0	479
5	1,089	2,318	700	42	4,149	11	9	1	0	21
6	209	389	149	12	759	0	1	1	0	2
7	566	2,182	532	14	3,294	279	543	38	0	860
8	141	357	152	4	654	94	161	4	0	259
9	399	10,935	1,414	62	12,810	21	44	5	0	70
10	49	977	118	9	1,153	1	3	0	0	4
11	594	16,153	1,903	101	18,751	679	3,079	277	0	4,035
12	256	3,372	514	54	4,196	293	740	89	0	1,122
13	89	3,243	539	36	3,907	1	16	0	0	17
14	25	856	144	15	1,040	1	2	0	0	3
15	132	5,094	781	37	6,044	132	848	96	0	1,076
16	57	1,546	240	13	1,856	73	282	23	0	378
17	275	489	259	4	1,027	52	26	1	0	79
18	108	183	141	2	434	11	26	1	0	38
19	51	207	99	3	360	2	4	0	0	6
20	27	77	60	0	164	1	2	0	0	3
21	295	2,507	644	28	3,474	26	51	18	0	95
22	171	1,250	273	21	1,715	17	43	10	0	70
23	44	724	178	11	957	0	6	1	0	7
24	29	478	99	7	613	3	5	0	0	8
Total	9,396	64,479	11,685	533	86,093	2,729	7,911	666	0	11,306

Table D-5. Distribution of Separations (FY 73/TOS 3)

	FY 73 Accessions Three Year Term of Service			
	Actions prior to ETS		Actions beyond ETS	
ETS month	> 12 months	12-0 months	1-12 months	> 12 months
July	.1036	.6759	.1601	.0604
August	.1109	.7141	.1277	.0473
September	.1073	.7277	.1287	.0363
October	.1113	.7154	.1404	.0329
November	.1263	.6932	.1467	.0338
December	.1274	.7178	.1249	.0299
January	.1380	.6988	.1355	.0277
February	.1407	.6994	.1359	.0241
March	.1302	.7091	.1371	.0235
April	.1393	.6991	.1443	.0172
May	.1457	.6729	.1655	.0160
June	.1163	.7426	.1285	.0127
Total	.1205	.7085	.1378	.0332

Table D-6. Distribution of Separations (FY 73/TOS 4)

	FY 73 Accessions Four Year Term of Service			
	Actions prior to ETS		Actions beyond ETS	
ETS month	> 12 months	12-0 months	1-12 months	> 12 months
July	.4275	.4275	.1145	.0343
August	.4349	.4191	.1200	.0259
September	.4359	.4338	.1135	.0168
October	.4457	.4107	.1320	.0117
November	.4464	.4278	.1118	.0140
December	.4621	.4282	.1026	.0071
January	.4778	.4059	.1092	.0071
February	.4284	.4579	.1049	.0087
March	.3850	.4831	.1255	.0063
April	.3935	.4984	.1065	.0016
May	.3021	.6052	.0927	.0000
June	.2584	.6387	.1029	.0000
Total	.3998	.4771	.1114	.0118

Table D-7. Distribution of Separations (FY 74/TOS 3)

ETS month	FY 74 Accessions Three Year Term of Service			
	Actions prior to ETS		Actions beyond ETS	
	> 12 months	12-0 months	1-12 months	> 12 months
July	.1049	.7493	.1325	.0133
August	.0954	.7543	.1400	.0103
September	.1048	.7472	.1380	.0099
October	.1094	.7278	.1545	.0083
November	.1244	.7235	.1438	.0083
December	.1128	.7560	.1241	.0071
January	.1195	.7326	.1427	.0052
February	.1132	.7381	.1432	.0055
March	.1092	.7591	.1282	.0035
April	.1230	.7452	.1295	.0022
May	.1225	.7516	.1244	.0016
June	.0924	.7816	.1259	.0000
Total	.1091	.7890	.1357	.0062

Table D-8. Distribution of Separations (FY 74/TOS 4)

ETS month	FY 74 Accessions Four Year Term of Service			
	Actions prior to ETS		Actions beyond ETS	
	> 12 months	12-0 months	1-12 months	> 12 months
July	.2446	.6553	.1001	.0000
August	.2542	.6564	.0895	.0000
September	.2426	.6860	.0714	.0000
October	.2491	.6629	.0881	.0000
November	.2295	.6826	.0879	.0000
December	.2508	.6799	.0693	.0000
January	.2404	.6784	.0812	.0000
February	.2461	.6951	.0588	.0000
March	.2665	.6718	.0285	.0000
April	.2874	.6777	.0349	.0000
May	.2496	.7218	.0286	.0000
June	.2060	.7940	.0000	.0000
Total	.2414	.6997	.0589	.0000

Table D-9. Reenlistments by ETS Month (FY 73 accessions)

ETS month	FY 73 accessions									
	Three-year term of service					Four-year term of service				
	Cell 1	Cell 2	Cell 3	Cell 4	Total	Cell 1	Cell2	Cell3	Cell4	Total
July	269	857	164	297	1,587	282	102	50	21	455
August	308	941	221	248	1,718	250	118	70	13	451
September	298	942	257	198	1,695	229	101	61	8	399
October	261	695	222	149	1,327	214	102	52	5	373
November	249	567	210	111	1,137	135	71	35	4	245
December	219	539	168	80	1,006	180	80	45	3	308
January	305	708	259	116	1,388	224	142	50	3	419
February	236	491	192	55	974	132	114	33	2	281
March	184	451	169	40	844	117	113	28	3	261
April	129	319	117	19	584	83	88	17	1	189
May	159	370	133	23	685	115	168	31	0	314
June	386	1,204	348	50	1,988	277	597	84	0	953
Total	3,000	8,084	2,460	1,386	14,930	2,238	1,796	556	63	4,653

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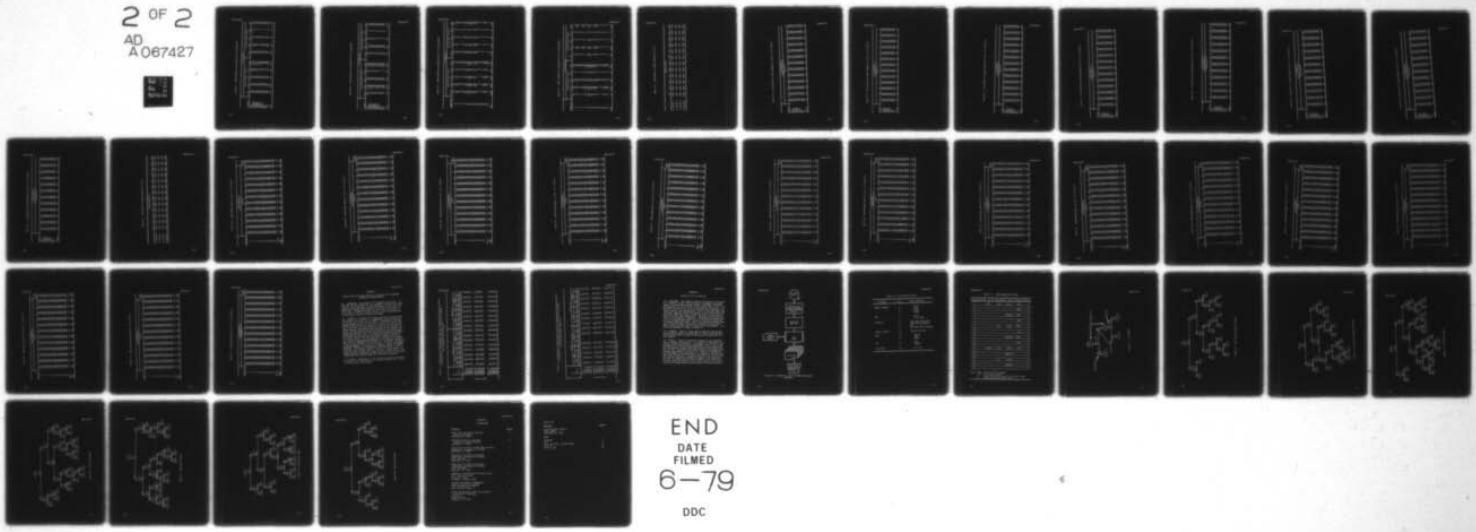

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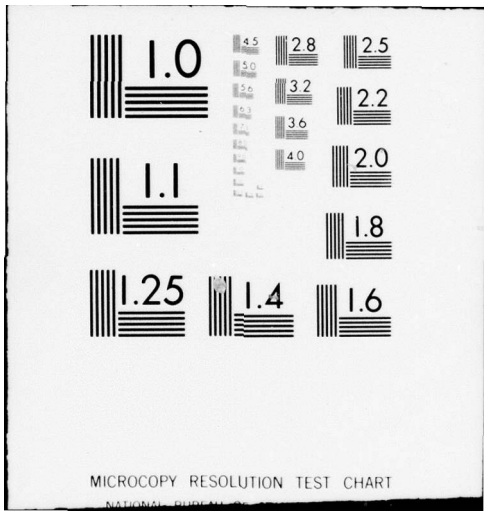
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Table D-9. Reenlistments by ETS Month (FY 73 accessions)

ETS month	FY 73 accessions									
	Three-year term of service					Four-year term of service				
	Cell 1	Cell 2	Cell 3	Cell 4	Total	Cell 1	Cell2	Cell3	Cell4	Total
July	269	857	164	297	1,587	282	102	50	21	455
August	308	941	221	248	1,718	250	118	70	13	451
September	298	942	257	198	1,695	229	101	61	8	399
October	261	695	222	149	1,327	214	102	52	5	373
November	249	567	210	111	1,137	135	71	35	4	245
December	219	539	168	80	1,006	180	80	45	3	308
January	305	708	259	116	1,388	224	142	50	3	419
February	236	491	192	55	974	132	114	33	2	281
March	184	451	169	40	844	117	113	28	3	261
April	129	319	117	19	584	83	88	17	1	189
May	159	370	133	23	685	115	168	31	0	314
June	386	1,204	348	50	1,988	277	597	84	0	953
Total	3,000	8,084	2,460	1,386	14,930	2,238	1,796	556	63	4,653

Table D-10. Reenlistments by ETS Month (FY 74 accessions)

ETS month	FY 74 accessions									
	Three-year term of service					Four-year term of service				
	Cell 1	Cell 2	Cell 3	Cell 4	Total	Cell 1	Cell 2	Cell 3	Cell 4	Total
July	169	1,140	308	46	1,663	65	173	33	0	271
August	75	1,186	337	34	1,632	48	243	28	0	319
September	50	1,146	322	27	1,545	40	223	21	0	284
October	36	1,050	290	19	1,395	29	174	15	0	218
November	32	975	255	18	1,280	16	159	13	0	188
December	29	749	161	11	950	23	136	9	0	168
January	54	1,250	290	23	1,617	36	206	10	0	252
February	41	1,020	243	9	1,313	28	210	7	0	245
March	40	987	209	5	1,241	21	182	4	0	207
April	49	965	168	3	1,185	44	156	4	0	204
May	66	1,159	184	3	1,412	34	194	2	0	230
June	77	2,189	462	0	2,728	107	604	0	0	711
Total	718	13,816	3,229	198	17,961	491	2,660	146	0	3,297

Table D-11. Reenlistments by Subpopulation (FY 73 accessions)

Subpopulation	FY 73 accessions									
	Three-year term of service					Four-year term of service				
	Cell 1	Cell 2	Cell 3	Cell 4	Total	Cell 1	Cell 2	Cell 3	Cell 4	Total
1	126	112	50	43	331	128	25	24	0	177
2	6	10	5	3	24	11	2	1	0	14
3	219	225	65	93	602	161	68	77	0	306
4	25	28	13	10	76	19	7	17	1	44
5	51	31	11	17	112	33	5	4	0	41
6	6	10	2	2	20	4	0	1	0	5
7	88	104	32	28	252	60	32	24	0	116
8	22	17	9	4	52	10	3	10	0	23
9	423	814	196	138	1,571	362	123	60	5	550
10	54	56	14	14	138	51	7	5	0	73
11	1,070	3,350	897	520	5,837	787	815	173	27	1,802
12	202	630	228	91	1,151	177	137	37	5	356
13	117	267	88	49	521	113	37	16	1	167
14	25	38	10	6	79	20	10	4	0	34
15	330	1,397	421	221	2,369	241	400	65	18	724
16	83	287	103	37	510	50	88	21	3	162
17	21	21	4	10	56	0	1	4	0	5
18	3	3	1	8	15	0	2	0	0	2
19	0	13	3	2	18	0	0	0	0	0
20	5	1	1	1	8	0	1	0	0	1
21	66	284	137	51	538	5	17	5	3	30
22	30	150	68	21	269	3	9	6	0	18
23	22	165	69	13	289	2	5	2	0	9
24	6	71	33	4	114	1	2	0	0	3
Total	3,000	8,084	2,460	1,386	14,930	2,238	1,796	556	63	4,653

Table D-12. Reenlistments by Subpopulation (FY 74 accessions)

Subpopulation	FY 74 accessions									
	Three-year term of service					Four-year term of service				
	Cell 1	Cell 2	Cell 3	Cell 4	Total	Cell 1	Cell 2	Cell 3	Cell 4	Total
1	21	186	137	0	344	0	9	0	0	9
2	4	15	16	0	35	0	0	0	0	0
3	33	202	232	3	470	21	454	9	0	484
4	9	36	80	1	126	5	137	1	0	143
5	5	97	75	1	178	0	2	0	0	2
6	0	26	29	3	58	0	0	0	0	0
7	5	163	129	3	300	9	214	4	0	227
8	3	33	37	2	75	3	88	0	0	91
9	90	2,576	348	29	3,043	2	13	3	0	18
10	9	352	39	6	406	1	1	0	0	2
11	220	3,290	540	44	4,094	242	871	61	0	1,174
12	122	955	195	23	1,295	125	260	26	0	411
13	32	1,192	193	14	1,431	1	7	0	0	8
14	10	379	57	6	452	0	1	0	0	1
15	71	2,068	364	20	2,523	53	432	26	0	511
16	22	676	104	10	812	26	131	9	0	166
17	2	29	82	1	114	0	10	0	0	10
18	3	9	49	0	61	0	7	0	0	7
19	2	23	47	2	74	0	0	0	0	0
20	1	7	31	0	39	0	1	0	0	1
21	20	543	197	12	772	0	11	5	0	16
22	17	392	97	9	515	2	5	1	0	8
23	10	318	89	3	420	0	2	1	0	3
24	7	249	62	6	324	1	4	0	0	5
Total	718	13,816	3,229	198	17,961	491	2,660	146	0	3,297

Table D-13. Distribution of Reenlistments for Cell 1

	Months to ETS											
	24	23	22	21	20	19	18	17	16	15	14	13
FY 73/TOS 3	.0000	.0000	.0000	.0000	.0000	.0000	.0010	.0013	.0057	.4901	.3238	.1780
FY 73/TOS 4	.0971	.0710	.0598	.0477	.0396	.0337	.0211	.0139	.0085	.0063	.0054	.0031
FY 74/TOS 3	.0000	.0000	.0000	.0000	.0000	.0000	.0424	.0625	.0777	.4336	.2316	.1525
FY 74/TOS 4	.0690	.0669	.0523	.0418	.0502	.0460	.0314	.0356	.0356	.0544	.0481	.0167

Table D-14. Distribution of Reenlistments for Cell 2 (FY 73/TOS 3)

ETS month	FY 73 accessions, Three-years term of service: Months to ETS 12	11	10	9	8	7	6	5	4	3	2	1	0
July	.0642	.0630	.0595	.0805	.0933	.0782	.0688	.0968	.1074	.0898	.0362	.0782	.0840
August	.0786	.0936	.0861	.0765	.0754	.0829	.0527	.0871	.0425	.0276	.0287	.1892	.0691
September	.0796	.0923	.0711	.0764	.0902	.0594	.0945	.0435	.0032	.0350	.1592	.1093	.0860
October	.0993	.0878	.1108	.1022	.0547	.1021	.0331	.0014	.0029	.1324	.0748	.0834	.1151
November	.0952	.1340	.0794	.0794	.0864	.0476	.0035	.0035	.0106	.0935	.0952	.1499	.1217
December	.1224	.1020	.0742	.0983	.0408	.0018	.0018	.0018	.0037	.1132	.1521	.1410	.1466
January	.1229	.0932	.1215	.0424	.0071	.0056	.0042	.0028	.0000	.1215	.1525	.1850	.1412
February	.1120	.1344	.0428	.0122	.0020	.0061	.0041	.0020	.0041	.1731	.1935	.1405	.1731
March	.1530	.0621	.0089	.0066	.0133	.0044	.0044	.0022	.0044	.2461	.1996	.1508	.1441
April	.0752	.0125	.0000	.1057	.0125	.0000	.0000	.0063	.0031	.2194	.2194	.2288	.2069
May	.0189	.0027	.0162	.0027	.0054	.0135	.0108	.0108	.0135	.1594	.3919	.2486	.1054
June	.0091	.0174	.0058	.0050	.0050	.0066	.0042	.0042	.0066	.2948	.2948	.2060	.1404
Composite	.0799	.0751	.0600	.0536	.0456	.0398	.0308	.0278	.0202	.1371	.1557	.1544	.1200

Table D-15. Distribution of Reenlistments for Cell 2 (FY 73/TOS 4)

	FY 73 accessions Four-year term of service												
	Months to ETS												
ETS month	12	11	10	9	8	7	6	5	4	3	2	1	0
July	.0490	.0098	.0000	.0000	.0000	.0000	.0098	.0000	.0018	.3235	.2451	.1470	.2059
August	.0000	.0000	.0000	.0000	.0085	.0000	.0000	.0000	.0339	.2966	.3136	.2119	.1356
September	.0000	.0000	.0297	.0000	.0000	.0000	.0099	.0297	.0099	.3168	.2079	.2178	.1782
October	.0000	.0098	.0000	.0000	.0000	.0000	.0196	.0196	.0098	.2941	.2157	.7765	.2549
November	.0000	.0000	.0000	.0000	.0141	.0141	.0282	.0000	.0282	.2254	.3239	.2394	.1268
December	.0000	.0000	.0125	.0000	.0375	.0250	.0250	.0375	.0500	.2250	.2250	.2500	.1125
January	.0070	.0141	.0070	.0352	.0282	.0422	.0282	.0352	.0493	.2324	.2465	.1831	.0915
February	.0000	.0000	.0000	.0351	.0175	.0000	.0000	.0175	.0263	.4035	.2807	.1491	.0702
March	.0000	.0177	.0177	.0088	.0177	.0088	.0265	.0354	.0265	.2832	.2389	.1504	.1681
April	.0000	.0000	.0341	.0341	.0000	.0000	.0341	.0341	.0454	.2841	.3295	.2045	.0682
May	.0060	.0238	.0119	.0060	.0119	.0000	.0000	.0119	.0060	.2500	.3988	.1607	.1131
June	.0117	.0084	.0134	.0084	.0134	.0050	.0184	.0151	.0134	.4640	.1943	.1574	.0771
Composite	.0078	.0084	.0100	.0095	.0128	.0072	.0150	.0184	.0217	.3446	.2517	.1759	.1169

Table D-16. Distribution of Reenlistments for Cell 2 (FY 74/TOS 3)

	FY 74 accessions Three-year term of service												
	Months to ETS												
ETS month	12	11	10	9	8	7	6	5	4	3	2	1	0
July	.0184	.0018	.0088	.0053	.0044	.0053	.0035	.0061	.0044	.3246	.3043	.1991	.1140
August	.0118	.0076	.0084	.0042	.0084	.0110	.0034	.0067	.0076	.3094	.3145	.1661	.1408
September	.0122	.0105	.0079	.0087	.0096	.0052	.0052	.0026	.0035	.3613	.2469	.1876	.1387
October	.0114	.0114	.0066	.0095	.0086	.0133	.0066	.0076	.0104	.3086	.2638	.1771	.1648
November	.0113	.0103	.0051	.0113	.0041	.0072	.0082	.0174	.0133	.3138	.2523	.2031	.1426
December	.0080	.0067	.0093	.0067	.0160	.0053	.0053	.0067	.0053	.3445	.3071	.1749	.1041
January	.0088	.0112	.0096	.0136	.0080	.0080	.0080	.0048	.0104	.3392	.2896	.1952	.0936
February	.0157	.0108	.0147	.0069	.0078	.0088	.0127	.0098	.0127	.3578	.2873	.1510	.1039
March	.0172	.0162	.0122	.0101	.0122	.0061	.0142	.0071	.0182	.3830	.2249	.1581	.1185
April	.0187	.0052	.0166	.0114	.0062	.0124	.0166	.0145	.0187	.3585	.2394	.1721	.1098
May	.0129	.0155	.0129	.0164	.0112	.0138	.0190	.0164	.0242	.2959	.3046	.1484	.1087
June	.0096	.0087	.0101	.0091	.0082	.0073	.0087	.0119	.0110	.3792	.2444	.1736	.1183
Composite	.0127	.0096	.0101	.0095	.0085	.0086	.0092	.0094	.0116	.3420	.2716	.1757	.1214

Table D-17. Distribution of Reenlistments for Cell 2 (FY 74/TOS 4)

	FY 74 accessions Four-year term of service												
	Months to ETS												
ETS month	12	11	10	9	8	7	6	5	4	3	2	1	0
July	.0231	.0000	.0000	.0116	.0116	.0000	.0231	.0173	.2312	.2890	.1965	.1272	.0809
August	.0082	.0000	.0000	.0165	.0041	.0206	.0082	.0247	.2675	.2387	.2058	.1481	.0576
September	.0134	.0000	.0179	.0090	.0134	.0045	.0090	.2063	.1839	.2422	.1525	.0807	.0673
October	.0297	.0172	.0297	.0000	.0115	.0057	.0297	.3161	.1494	.1322	.1552	.0920	.0345
November	.0000	.0063	.0063	.0126	.0000	.0063	.2264	.2516	.1698	.1132	.1006	.0629	.0440
December	.0074	.0000	.0074	.0147	.0000	.0074	.3382	.1912	.1103	.1544	.1103	.0368	.0221
January	.0146	.0049	.0049	.0049	.0146	.0097	.2573	.2573	.1359	.1311	.0583	.0534	.0534
February	.0095	.0048	.0000	.0048	.0000	.0095	.2429	.2905	.1286	.1143	.1190	.0429	.0333
March	.0110	.0000	.0055	.0000	.0110	.0165	.2582	.2473	.1374	.1648	.0769	.0495	.0220
April	.0064	.0064	.0128	.0000	.0064	.0128	.3077	.1859	.1218	.1731	.0833	.0577	.0256
May	.0155	.0000	.0000	.0103	.0103	.0103	.2371	.1907	.1082	.1392	.1546	.0825	.0412
June	.0083	.0050	.0050	.0083	.0066	.0033	.2632	.2235	.1159	.1623	.0794	.0745	.0447
Composite	.0117	.0038	.0068	.0079	.0075	.0083	.1868	.2015	.1519	.1718	.1195	.0774	.0451

Table D-18. Distribution of Reenlistments for Cell 3 (FY 73/TOS 3)

ETS month	FY 73 accessions, Three-year term of service — Months beyond ETS											
	1	2	3	4	5	6	7	8	9	10	11	12
July	.1036	.0854	.0915	.0366	.0488	.0305	.0549	.0366	.1402	.1158	.1351	.1220
August	.1086	.1131	.0769	.1176	.0905	.0362	.0633	.0452	.0769	.1131	.1041	.0543
September	.0895	.1012	.1284	.0622	.0584	.0622	.0661	.0856	.1128	.0739	.1050	.0545
October	.1306	.0991	.1036	.0586	.0721	.0946	.0540	.0540	.0766	.0811	.0766	.0991
November	.1667	.0857	.0810	.0667	.1048	.0857	.0571	.0619	.0762	.0810	.0524	.0810
December	.1250	.0893	.0833	.1310	.0774	.1250	.0536	.0417	.0774	.0952	.0655	.0357
January	.1236	.1197	.1428	.0888	.0772	.0579	.0579	.0656	.0463	.0927	.0734	.0540
February	.1614	.0833	.0938	.0833	.0677	.1146	.0729	.0521	.0833	.0677	.0729	.0469
March	.1538	.1243	.1124	.1302	.0947	.0355	.0651	.0237	.0710	.0828	.0651	.0414
April	.1026	.0598	.1709	.0855	.0855	.1282	.0427	.0342	.0513	.0598	.0684	.1111
May	.2180	.0677	.1579	.1053	.0602	.0526	.0301	.0526	.0677	.0902	.0677	.0301
June	.1724	.1178	.1207	.1149	.0747	.0776	.0431	.0661	.0804	.0431	.0661	.0230
Composite	.1378	.0996	.1122	.0902	.0760	.0736	.0557	.0549	.0805	.0809	.0793	.0594

Table D-19. Distribution of Reenlistments for Cell 3 (FY 73/TOS 4)

	FY 73 accessions Four-year term of service											
	Months beyond ETS											
ETS month	1	2	3	4	5	6	7	8	9	10	11	12
July	.1600	.0600	.1800	.0800	.0800	.0800	.0200	.0600	.1400	.0800	.0400	.0200
August	.1714	.1286	.1143	.0857	.0286	.0571	.1143	.0857	.1143	.0143	.0286	.0571
September	.1803	.1639	.1311	.0656	.0984	.0984	.0492	.0984	.0164	.0328	.0328	.0328
October	.1154	.0962	.0192	.1538	.0962	.1346	.0577	.0577	.0769	.0577	.0769	.0577
November	.2857	.0000	.1714	.0286	.0857	.0571	.1143	.0857	.1143	.0286	.0286	.0000
December	.0889	.1111	.0889	.1556	.1556	.1333	.0889	.0222	.0000	.0444	.0667	.0444
January	.1000	.1200	.1200	.1800	.0200	.0400	.1000	.1000	.0400	.0600	.0400	.0800
February	.2424	.0303	.1212	.1212	.0000	.0606	.0909	.0303	.0000	.1818	.0606	.0606
March	.2857	.1071	.1786	.0000	.0000	.1428	.1071	.0357	.0357	.0357	.0357	.0357
April	.2353	.2353	.1176	.0588	.0588	.0588	.0000	.0000	.0588	.0588	.1176	.0000
May	.3226	.1613	.1290	.0000	.0322	.0322	.0322	.0322	.1290	.0322	.0322	.0645
June	.1786	.1786	.0714	.0595	.0952	.0595	.1071	.0595	.0833	.0476	.0357	.0238
Composite	.1816	.1187	.1133	.0881	.0683	.0791	.0791	.0629	.0701	.0521	.0450	.0414

Table D-20. Distribution of Reenlistments for Cell 3 (FY 74/TOS 3)

ETS month	FY 74 accessions, Three-year term of service: Months beyond ETS 1	2	3	4	5	6	7	8	9	10	11	12
July	.1656	.1429	.1299	.0617	.0682	.0942	.0552	.0747	.0942	.0584	.0227	.0325
August	.1573	.1395	.1306	.0831	.0534	.0801	.0534	.0861	.0979	.0504	.0326	.0356
September	.2050	.0870	.1335	.0652	.0932	.0652	.0652	.1025	.0683	.0652	.0342	.0155
October	.1759	.1483	.1069	.0724	.0759	.0793	.0966	.0655	.0586	.0655	.0345	.0207
November	.1804	.1059	.1137	.0759	.0759	.1373	.0784	.0627	.0549	.0431	.0353	.0471
December	.1242	.0807	.1677	.0994	.1118	.1304	.0559	.0497	.0373	.0621	.0373	.0435
January	.1310	.1379	.1552	.1138	.0931	.1000	.0552	.0448	.0759	.0310	.0379	.0241
February	.1440	.2016	.1152	.1029	.1070	.0947	.0412	.0453	.0576	.0370	.0329	.0206
March	.1770	.2010	.1292	.0909	.0526	.0861	.0383	.0574	.0335	.0478	.0431	.0431
April	.1845	.1250	.1131	.1012	.0833	.1071	.0417	.0655	.0595	.0357	.0417	.0298
May	.2391	.1196	.0924	.1141	.0652	.0870	.0543	.0272	.0761	.0543	.0326	.0380
June	.1623	.1255	.1104	.0909	.0779	.0887	.0779	.0584	.0541	.0433	.0758	.0346
Composite	.1694	.1344	.1242	.0867	.0784	.0932	.0619	.0641	.0660	.0502	.0403	.0313

Table D-21. Distribution of Reenlistments for Cell 3 (FY 74/TOS 4)

	FY 74 accessions Four-year term of service											
	Months beyond ETS											
ETS month	1	2	3	4	5	6	7	8	9	10	11	12
July	.2121	.0606	.1212	.1515	.1515	.0303	.0303	.0606	.1212	.0303	.0303	.0000
August	.2143	.2143	.0714	.0714	.0714	.0357	.0357	.0714	.1071	.1071	.0000	.0000
September	.1905	.0952	.2381	.0952	.1429	.0476	.0476	.0000	.1429	.0000	.0000	.0000
October	.2000	.0667	.0000	.1333	.1333	.1333	.1333	.2000	.0000	.0000	.0000	.0000
November	.1538	.1538	.1538	.0000	.0769	.1538	.3077	.0000	.0000	.0000	.0000	.0000
December	.3333	.1111	.2222	.1111	.0000	.2222	.0000	.0000	.0000	.0000	.0000	.0000
January	.0000	.3000	.3000	.3000	.1000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
February	.7143	.0000	.2857	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
March	.7500	.0000	.2500	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
April	.7500	.2500	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
May	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
June	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
Composite	.2603	.1233	.1438	.1027	.0959	.0616	.0616	.0479	.0685	.0274	.0068	.0000

Table D-22. Distribution of Reenlistments for Cell 4

	Months beyond ETS												
	13	14	15	16	17	18	19	20	21	22	23	24	> 24
FY 73/TOS 3	.0794	.0758	.0632	.0590	.0646	.0822	.0864	.0822	.0730	.0569	.0309	.2060	.2205
FY 73/TOS 4	.1923	.1026	.1410	.0641	.0256	.0897	.1026	.0769	.0513	.0897	.0513	.0128	.0000
FY 74/TOS 3	.2193	.1623	.1009	.1096	.0921	.0921	.0438	.0526	.0526	.0438	.0219	.0088	.0000
FY 74/TOS 4	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000

Table D-23. Reenlistment Rates for Cell 1 (FY 73/TOS 3)

Subpopulation	FY 73 accessions, Three-year term of service: ETS month Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Subpopulation rate
1	.0506	.0707	.0925	.0656	.0681	.0516	.0843	.0714	.1591	.1111	.1176	.1013	.0764
2	.0000	.0000	.0000	.1429	.1429	.0000	.2308	.0000	.0000	.0000	.1667	.0000	.0790
3	.0884	.0858	.0705	.0588	.0904	.0774	.0947	.0980	.1400	.1642	.1892	.1502	.0975
4	.2222	.0435	.1364	.0556	.1111	.1053	.3529	.2105	.2000	.1000	.0000	.0000	.1316
5	.1176	.0556	.0727	.1064	.1053	.1273	.1500	.1304	.1429	.2308	.0952	.0968	.1116
6	.0000	.0000	.0000	.0000	.2000	.0833	.0909	1.0000	.0000	.0000	.5000	.0000	.1132
7	.0964	.0341	.0870	.0714	.0926	.1458	.1094	.1538	.1020	.1429	.1724	.2300	.1175
8	.1176	.0000	.1429	.1111	.0000	.0000	.2222	.3846	.2143	.1429	.1667	.4000	.1692
9	.7826	.8235	.7541	.7838	.7500	.6935	.5213	.5366	.6429	.4737	.6154	.8235	.6946
10	.6667	.6667	1.0000	.5000	1.0000	1.0000	.7000	.8333	.6667	.6667	1.0000	1.0000	.7941
11	.7152	.6559	.6154	.5586	.7684	.6228	.5723	.5735	.6132	.7164	.6824	.6710	.6411
12	.7059	.9000	.6316	.6800	.6667	.6667	.5429	.5758	.6286	.5600	.6111	.6250	.6474
13	.9000	.6923	.6925	.8824	.9167	.7692	.7857	.4286	1.0000	.4000	.7500	.8571	.7959
14	.0000	.3333	1.0000	.6250	1.0000	1.0000	1.0000	1.0000	.0000	.0000	.6667	1.0000	.8065
15	.7750	.7500	.8039	.8462	.5926	.8400	.6452	.8235	.6923	.8182	.6667	.7660	.7569
16	1.0000	.6667	.8750	.7692	1.0000	1.0000	1.0000	.8462	.7500	.8333	.6667	.8462	.8300
17	.0789	.0303	.0000	.0541	.1111	.0556	.0286	.2069	.0417	.0690	.0625	.0000	.0587
18	.0000	.0000	.0000	.0000	.1250	.0000	.1111	.1000	.0000	.0000	.0000	.0000	.0345
19	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
20	.3333	.0000	1.0000	.5000	.0000	.0000	.0000	.0000	.5000	.0000	.5000	.0000	.2778
21	.2353	.2800	.1714	.2000	.2439	.0000	.1277	.2581	.0833	.1111	.2222	.1892	.1779
22	.5000	.2727	.5000	.1250	.0588	.2857	.3846	.2000	.1538	.1333	.4545	.1250	.2344
23	.0000	.5000	.3333	.6667	.5000	.0000	.3750	.4286	.3333	.6667	.7500	.6000	.4400
24	.0000	.0000	.0000	.0000	.1667	.4000	.0000	.3333	.0000	.0000	.2500	.2500	.1714
Composite	.2874	.2765	.2614	.2765	.2895	.2820	.2583	.3151	.3352	.3316	.3786	.3971	.2994
Male	.3006	.2877	.2747	.2940	.3072	.2976	.2729	.3302	.3863	.4013	.4034	.4299	.3191
Female	.1268	.1412	.1212	.1346	.1667	.0877	.1311	.2178	.0938	.1000	.2381	.1176	.1395

Table D-24. Reenlistment Rates for Cell 1 (FY 73/TOS 4)

Subpopulation	FY 73 accessions, Four-year term of service: ETS month Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Subpopulation rate
1	.1500	.0543	.1293	.0570	.0580	.1274	.0820	.0952	.1509	.0278	.0000	.0769	.0922
2	.0000	.1000	.3333	.0000	.1250	.0000	.3750	.3333	.1667	.0000	.0000	.0000	.1667
3	.1166	.0970	.0846	.1069	.0504	.0756	.1176	.1170	.1311	.1087	.1379	.1100	.1033
4	.0000	.0556	.1429	.2143	.4545	.1176	.1053	.0000	.0909	.2500	.2500	.1111	.1267
5	.1429	.0370	.0317	.1163	.0435	.0714	.0806	.1481	.1429	.2727	.3333	.0909	.0875
6	.2500	.0000	.0000	.0000	.0000	.0000	.3000	.0000	.0000	.0000	.0000	.0000	.1026
7	.2245	.1364	.0838	.1026	.0000	.0233	.1250	.0698	.1250	.2174	.1739	.1395	.1172
8	.0000	.1667	.2000	.1111	.0000	.0667	.0769	.2000	.2143	.0000	.0000	.0000	.0980
9	.6912	.6061	.4842	.4787	.5397	.6329	.4953	.5946	.5000	.4118	.7500	.2500	.5452
10	1.0000	.9000	.5714	.7500	.5000	.5455	.7000	.6000	.7143	.0000	.5000	.0000	.6711
11	.6313	.6228	.5433	.5259	.5362	.5532	.5288	.4091	.5000	.5349	.5814	.5275	.5484
12	.5172	.7059	.6522	.6774	.5238	.6250	.5652	.5172	.4615	.6667	.6250	.6800	.6083
13	.7647	.6154	.7419	.6818	.6000	.5625	.6538	.0000	.7273	1.0000	.0000	.2506	.6494
14	.7500	1.0000	.8333	.6667	.5000	.0000	.5000	1.0000	.6667	1.0000	1.0000	.0000	.7407
15	.7381	.7857	.7241	.6970	.4615	.5455	.6860	.7309	.6364	.7273	.6400	.5570	.6585
16	1.0000	.7143	.3750	1.0000	.7778	.8000	.3333	.5000	.7143	.6000	.7143	.3333	.6329
17	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
18	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
19	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
20	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
21	1.0000	.0000	.0000	.0000	.2000	.5000	.0000	.0000	.0000	.0000	.5000	.0000	.1020
22	.0000	.0000	.0000	.0000	.3333	.0000	.0000	.0000	.3333	1.0000	.0000	.0000	.2308
23	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.6667	.0000	.0000	0000	.0000	.3333
24	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.3333
Composite	.3648	.2924	.2852	.2948	.2348	.2757	.2572	.2672	.3205	.3402	.3795	.3236	.2977
Male	.3675	.3185	.3041	.2993	.2358	.2771	.2611	.2703	.3268	.3529	.3800	.3247	.3048
Female	.1818	.0000	.0000	.0000	.1818	.1429	.0588	.1538	.1000	.1667	.3333	.0000	.0519

Table D-25. Reenlistment Rates for Cell 1 (FY 74/TOS 3)

Subpopulation	FY 74 accessions, Three-year term of service: ETS month Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Subpopulation rate
1	.0146	.0046	.0146	.0130	.0030	.0000	.0082	.0043	.0092	.0052	.0041	.0032	.0068
2	.0000	.1111	.0909	.0000	.0000	.0526	.0000	.0000	.0000	.0667	.0000	.0000	.0214
3	.0714	.0362	.0211	.0098	.0000	.0000	.0323	.0091	.0189	.0000	.0127	.0289	.0241
4	.0000	.0909	.0556	.0000	.1000	.0000	.0625	.0000	.0000	.0588	.1818	.0000	.0559
5	.0303	.0000	.0180	.0000	.0097	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0046
6	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
7	.0323	.0000	.0000	.0167	.0000	.0000	.0200	.0000	.0000	.0000	.0357	.0000	.0088
8	.0000	.1818	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0714	.0000	.0213
9	.5185	.2500	.2564	.2857	.0588	.1613	.1064	.2400	.2222	.2778	.1429	.2500	.2256
10	.7500	.6000	.0000	.3333	.0000	.0000	.3333	.0000	.0000	.0000	.0000	.0000	.1837
11	.5208	.4189	.3200	.3158	.3529	.4348	.2200	.2273	.2571	.3939	.4857	.3537	.3704
12	.6250	.4118	.1667	.2143	.4706	.5833	.4643	.5000	.5000	.4091	.5778	.4815	.4766
13	.4706	.6667	.4444	.0000	.2222	.4000	.0000	.5000	.3333	.3750	.3333	.4000	.3596
14	1.0000	1.0000	.2500	.0000	.2500	.2500	.5000	.0000	.0000	.0000	.0000	.0000	.4000
15	.8163	.3333	.3333	.2500	.0000	.0000	.2857	.3000	.3333	.4000	.7143	.6429	.5379
16	.6667	.5000	.0000	.0000	.2500	.3333	.3333	.2857	.5000	.3333	.5000	.6667	.3860
17	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0417	.0000	.0227	.0073
18	.1111	.0000	.0000	.0000	.0000	.5000	.0000	.0000	.0000	.0000	.0714	.0000	.0278
19	.3333	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0714	.0392
20	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.5000	.0000	.0000	.0000	.0000	.0370
21	.1860	.0741	.0256	.1111	.0400	.0000	.0435	.0000	.0476	.0625	.0000	.0667	.0678
22	.0556	.2000	.0000	.0000	.1818	.2000	.0741	.0556	.1538	.2308	.1579	.0455	.0994
23	.2857	.5000	.4000	.3333	.0000	.0000	.0000	.1667	.2500	.3333	.0000	.1429	.2273
24	.5000	.0000	.0000	.0000	.0000	.0000	.7500	.5000	.0000	.0000	.0000	.0000	.2414
Composite	.2139	.0983	.0571	.0448	.0394	.0504	.0571	.0586	.0613	.0742	.0935	.0691	.0764
Male	.2258	.1020	.0607	.0448	.0386	.0497	.0566	.0581	.0622	.0747	.0992	.0724	.0781
Female	.1389	.0598	.0297	.0447	.0500	.0625	.0612	.0625	.0548	.0714	.0494	.0476	.0620

Table D-26. Reenlistment Rates for Cell 1 (FY 74/TOS 4)

Subpopulation	FY 74 accessions, Four-year term of service: ETS month Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Subpopulation rate
1	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
2	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
3	.0750	.0488	.0411	.0145	.0000	.0000	.0476	.0000	.0000	.0256	.0000	.0197	.0248
4	.2500	.0000	.0000	.0000	.1111	.0000	.0000	.0000	.0909	.0000	.0769	.0714	.0333
5	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
6	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
7	.0000	.0526	.0000	.0500	.0000	.0000	.1000	.0000	.0625	.0000	.0667	.0357	.0323
8	.0000	.1111	.0000	.0000	.2000	.0000	.0000	.0000	.0000	.0000	.0000	.1000	.0319
9	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.5000	.0952
10	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.0000	1.0000
11	.4024	.3289	.3492	.3409	.2759	.2927	.3200	.3077	.2326	.4286	.3438	.4492	.3564
12	.5714	.2727	.3214	.5000	.2778	.4500	.4400	.3333	.2105	.5172	.5000	.5454	.4266
13	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	.0000	1.0000
14	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
15	.6667	.4210	.4545	.5000	.0000	.1428	.3333	.2727	.3333	.0000	.2857	.6190	.4015
16	.3750	.4000	.1428	.0000	.1000	.3333	.2500	.3333	.2500	.7000	1.0000	.1667	.3562
17	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
18	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
19	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
20	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
21	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
22	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	.5000	.1176
23	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
24	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	.0000	.3333
Composite	.2510	.1579	.1569	.1465	.1039	.1513	.1644	.1366	.1105	.2543	.2048	.2357	.1799
Male	.2642	.1739	.1724	.1568	.1060	.1523	.1674	.1393	.1117	.2558	.2000	.2409	.1865
Female	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.3333	.0714	.0268

Table D-27. Reenlistment Rates for Cell 2 (FY 73/TOS 3)

Subpopulation	FY 73 accessions, Three-year term of service: ETS month Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Subpopulation rate
1	.0347	.0435	.0524	.0388	.0526	.0148	.0289	.0207	.0722	.0714	.0000	.0000	.0364
2	.1176	.4286	.1429	.0000	.0000	.0769	.0000	.0000	.0000	.0000	.0000	.0000	.1010
3	.0599	.0657	.0454	.0472	.0447	.0384	.0402	.0389	.0359	.0145	.0463	.0489	.0476
4	.0357	.0513	.0385	.1111	.0741	.1071	.1190	.0968	.0909	.0000	.0400	.1429	.0767
5	.0392	.0177	.0000	.0588	.0431	.0526	.0160	.0227	.0222	.0000	.0000	.0270	.0286
6	.1818	.1176	.1111	.0000	.1250	.0588	.2222	.0000	.0000	.2500	.0000	.0000	.0971
7	.0701	.0802	.0854	.0427	.0263	.0714	.0563	.0583	.0679	.0556	.0806	.0933	.0680
8	.1667	.0769	.0800	.1053	.0833	.1111	.0789	.0333	.0000	.0000	.1250	.0454	.0686
9	.1439	.1928	.1749	.1268	.1203	.1201	.1195	.1122	.1302	.1058	.1513	.1758	.1426
10	.2632	.2800	.1500	.2059	.1667	.1471	.0857	.1667	.2400	.3000	.2000	.1739	.1842
11	.1311	.1107	.1047	.1006	.1122	.1191	.1165	.1110	.1181	.1273	.1574	.1790	.1224
12	.1272	.1316	.1221	.1130	.1449	.1563	.1368	.1950	.2014	.2264	.2733	.2125	.1582
13	.3238	.2464	.1931	.2446	.1789	.2150	.1603	.1154	.2955	.2941	.2791	.3263	.2294
14	.4000	.1875	.4000	.2667	.3333	.4286	.1923	.1000	.1000	.2222	.1667	.1538	.2484
15	.2594	.2570	.2249	.2112	.2399	.2768	.2522	.2500	.2704	.3500	.3402	.3393	.2739
16	.4333	.2875	.2523	.2195	.2935	.2029	.2500	.2752	.2883	.2706	.2931	.3086	.2776
17	.2000	.2857	.1176	.3333	.1875	.0000	.1000	.0625	.1333	.0000	.0000	.0000	.1373
18	.0000	.0000	.5000	.0000	.0000	.0000	.2500	.1667	.0000	.0000	.0000	.0000	.0677
19	.0000	.0000	.2857	.250	.1250	.0000	.5000	.2857	.0000	.2000	.3333	.2500	.2097
20	.0000	.0000	.0000	.0000	.0000	.0000	.3333	.0000	.0000	.0000	.0000	.0000	.0714
21	.2178	.1711	.1797	.2256	.1594	.2656	.1656	.1652	.2222	.1348	.2118	.2171	.1924
22	.3913	.3684	.3684	.2619	.2041	.2500	.2778	.3137	.2979	.2245	.3226	.2500	.2901
23	.3529	.3939	.4571	.4375	.2571	.4074	.4375	.3333	.3784	.3913	.3810	.4375	.3882
24	.7143	.1429	.5625	.4546	.2857	.3636	.2400	.4000	.5000	.6471	.4737	.4286	.4303
Composite	.1403	.1312	.1218	.1146	.1202	.1249	.1184	.1319	.1509	.1634	.1907	.1939	.1372
Male	.1362	.1275	.1168	.1075	.1163	.1198	.1118	.1244	.1412	.1536	.1809	.1916	.1449
Female	.2713	.2348	.2746	.2647	.1849	.2815	.2358	.2335	.2650	.2409	.2745	.2436	.2478

Table D-28. Reenlistment Rates for Cell 2 (FY 73/TOS 4)

Subpopulation	FY 73 accessions, Four-year term of service — ETS month: Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Subpopulation rate
1	.0465	.0357	.0755	.0196	.0408	.0682	.0877	.0714	.1333	.2857	.0000	.0714	.0617
2	.0000	.0000	.0000	.0000	.1667	.0000	.5000	.0000	.0000	.0000	.0000	.0000	.1000
3	.0400	.0000	.0000	.1351	.0857	.0294	.0790	.0526	.0000	.1818	.1111	.0409	.0453
4	.0000	.0000	.0000	.5000	.0000	.0000	.1250	.0000	.3333	.1667	.2000	.0182	.0660
5	.0000	.0526	.0000	.0000	.0000	.0000	.0833	.0000	.2000	.0000	.2500	.0000	.0312
6	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
7	.0000	.0556	.0526	.0000	.0000	.0000	.1364	.0714	.1333	.0000	.1111	.0856	.0767
8	.0000	.0000	.0000	.0000	.0000	.0000	.1429	.2500	.0000	.0000	.0000	.0588	.0536
9	.1169	.1125	.1013	.1875	.2237	.1667	.1776	.1667	.2400	.2000	.5714	.8182	.1760
10	.2857	.1111	.0000	.3333	.0000	.0000	.3333	.0000	.5000	.5000	.0000	.0000	.1373
11	.1355	.1484	.0983	.1533	.1262	.1143	.1617	.1783	.2105	.2615	.2233	.7857	.2321
12	.2364	.1455	.2456	.1750	.1143	.1163	.2292	.3036	.1951	.2000	.2985	.7500	.2451
13	.2000	.1111	.1379	.2273	.1905	.3158	.1333	.2667	.2500	.2857	.2000	1.0000	.2126
14	.0000	.5000	.0000	.2500	.2500	.2000	.6667	.5000	.2500	.0000	.0000	.0000	.2632
15	.1923	.2987	.3210	.3256	.1591	.2642	.4154	.3788	.4426	.4490	.4597	.8457	.4494
16	.3333	.4375	.3000	.2500	.2000	.2727	.5263	.4138	.4167	.5333	.5882	1.0000	.4314
17	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.2000	.1250
18	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.1667
19	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
20	.0000	.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
21	.1111	.2000	.2857	.0526	.3333	.1667	.4286	.4000	1.0000	.1429	.0000	.5000	.2152
22	.0000	.2500	.0000	.1429	.2500	1.0000	.0000	.2500	.5000	.2500	.0000	.0000	.2046
23	.0000	.0000	.0000	.0000	.0000	.2500	1.0000	.0000	.0000	1.0000	.0000	.0000	.4167
24	.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.5000	.0000	.0000	.4000
Composite	.1332	.1432	.1264	.1525	.1289	.1322	.1919	.2159	.2467	.2848	.2768	.2821	.2002
Male	.1309	.1423	.1245	.1558	.1271	.1296	.1900	.2147	.2494	.2842	.2809	.2828	.1996
Female	.1667	.2222	.2500	.0741	.2500	.2727	.2632	.2727	.1111	.2941	.0000	.2105	.2284

Table D-29. Reenlistment Rates for Cell 2 (FY 74/TOS 3)

Subpopulation	FY 74 accessions, Three-year term of service: ETS month Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Subpopulation rate
1	.0480	.0273	.0248	.0295	.0343	.0186	.0507	.0572	.0398	.0302	.0538	.0357	.0363
2	.1053	.0000	.0435	.1667	.0588	.0556	.0476	.0667	.0500	.1429	.0714	.0116	.0530
3	.0424	.0328	.0508	.0497	.0308	.0642	.0414	.0582	.0121	.0380	.0474	.0369	.0392
4	.0588	.0000	.0714	.1579	.1667	.1034	.0968	.0385	.0625	.0400	.0227	.0516	.0616
5	.0473	.0443	.0105	.0466	.0663	.0324	.0667	.0303	.0259	.0133	.0298	.0550	.0418
6	.0500	.0000	.0667	.0571	.0312	.0000	.0571	.2667	.0500	.1364	.1379	.0606	.0668
7	.0452	.0699	.0526	.0619	.0790	.0976	.1132	.0778	.0423	.0732	.0435	.0845	.0747
8	.0667	.0526	.0000	.0435	.0000	.0000	.0400	.2381	.0000	.1429	.2000	.1260	.0924
9	.2173	.1887	.2040	.2022	.2367	.1885	.2155	.2345	.2311	.2452	.2742	.6839	.2356
10	.2273	.3111	.2688	.3750	.3218	.3699	.3390	.4045	.2805	.4078	.4533	.7429	.3603
11	.1817	.1842	.1525	.1485	.1542	.1810	.1680	.1817	.1802	.1915	.2330	.7759	.2037
12	.2180	.2000	.2444	.2269	.2222	.2740	.2332	.2507	.3050	.2691	.4043	.7664	.2832
13	.3466	.2993	.3256	.3186	.3493	.3162	.3542	.3785	.3500	.3730	.3969	.8280	.3676
14	.2857	.3611	.4000	.3895	.4177	.3296	.4557	.4394	.5152	.5323	.5909	.7632	.4428
15	.3504	.3467	.3056	.3267	.3451	.4158	.3649	.3438	.3431	.4154	.4157	.8845	.4060
16	.3832	.4016	.3448	.4688	.3546	.4177	.4078	.4375	.3973	.4491	.4430	.9189	.4373
17	.0000	.0000	.0435	.0526	.1176	.0769	.0000	.0000	.0000	.1500	.0435	.0692	.0593
18	.1000	.0000	.3333	.0000	.0000	.0000	.0000	.0000	.2500	.0000	.0000	.0463	.0492
19	.0000	.0000	.1667	.0000	.2000	.0000	.1429	.1429	.1429	.0000	.2727	.1056	.1111
20	.0000	.0000	.0000	.0000	.0000	.5000	.3333	.0000	.0000	.3333	.1250	.0652	.0909
21	.2023	.2069	.1838	.2092	.1840	.1440	.2383	.1547	.1548	.2245	.2552	.5000	.2166
22	.2885	.3125	.2000	.3524	.3404	.2656	.2376	.3333	.3565	.3109	.3203	.5286	.3136
23	.3750	.3333	.2679	.4737	.3611	.3824	.3836	.4237	.3857	.5306	.5000	.7467	.4392
24	.5500	.3636	.5833	.4878	.5472	.4667	.4600	.5238	.4821	.3409	.6000	.7692	.5209
Composite	.2020	.1967	.1838	.1966	.2065	.1943	.2156	.2234	.2177	.2413	.2675	.2323	.2143
Male	.1994	.1940	.1807	.1867	.1999	.1924	.2278	.2184	.2107	.2357	.2591	.2293	.2091
Female	.2432	.2294	.2181	.2806	.2590	.2201	.1585	.2725	.2831	.2926	.3288	.2607	.2654

Table D-30. Reenlistment Rates for Cell 2 (FY 74/TOS 4)

Subpopulation	FY 74 accessions, Four-year term of service — ETS month: Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Subpopulation rate
1	.0000	.3333	.2500	.0000	.4000	.5000	.6667	.5000	.0000	.0000	.0000	.0000	.3214
2	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
3	.0506	.1240	.1602	.5663	.7966	.6806	.6737	.8493	.6444	.3636	.1667	.2233	.2710
4	.0513	.2090	.2281	.8000	.7273	.7241	.8077	.7742	.7143	1.0000	.1250	.3000	.4322
5	.0000	.2500	.0000	.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.2222
6	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
7	.1563	.2642	.3229	.6471	.7941	.7500	.7647	.6400	.4615	.3333	.1538	.2667	.3941
8	.0000	.2308	.4400	.5385	.8667	.8235	.9412	.6471	.6364	.0000	.5000	.3333	.5466
9	.5000	.0000	.5000	.0000	.0000	.0000	.2000	.0000	.6000	.0000	.3333	.2941	.2954
10	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.3333
11	.7848	.7320	.7180	.1422	.1192	.0843	.1255	.2115	.2556	.3463	.3266	.3033	.2829
12	.6429	.8485	.8235	.4118	.2340	.0930	.1923	.1954	.3188	.4000	.4416	.3669	.3514
13	1.0000	1.0000	.0000	.0000	.0000	.0000	.5000	.0000	.0000	.0000	1.0000	.4286	.4375
14	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	.0000	.5000
15	.8889	.7941	.8710	.3333	.3158	.1786	.2692	.2093	.4906	.5306	.6351	.5183	.5094
16	.8462	.9091	.7500	.3158	.1000	.3333	.2727	.4483	.5556	.3954	.6364	.4595	.4645
17	.1818	.3333	.5000	.7500	.0000	1.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.3846
18	.0000	.3750	.0000	.6667	.0000	.0000	.5000	.0000	.0000	.0000	.0000	.0000	.2692
19	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
20	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.5000
21	.3333	.5000	.2500	.0833	.0000	.0000	.2500	.5000	.0000	1.0000	.0000	.0000	.2157
22	.4000	.3333	.0000	.0000	.0000	.0000	.1667	.0000	.0000	.0000	.0000	.2000	.1163
23	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.3333	.3333
24	.0000	.0000	.0000	1.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.5000	.8000
Composite	.2493	.3096	.3093	.3302	.3472	.3301	.3333	.3627	.3800	.3824	.4042	.3451	.3362
Male	.2500	.3071	.3112	.3354	.3518	.3325	.3350	.3649	.3810	.3818	.4058	.3472	.3382
Female	.2308	.3913	.2143	.2500	.0000	.2222	.2778	.2222	.2500	.5000	.0000	.1579	.2454

Table D-31. Reenlistment Rates for Cell 3 (FY 73/TOS 3)

Subpopulation	FY 73 accessions, Three-year term or service: ETS month Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Subpopulation rate
1	.0340	.0342	.0410	.0301	.0424	.0429	.1273	.1429	.0000	.0000	.1333	.1000	.0534
2	.0000	.1667	.0000	.0000	.0000	.1667	.0000	.6667	1.0000	.0000	.0000	.0000	.0926
3	.0349	.0709	.0547	.0745	.0441	.0556	.0543	.0769	.1622	.0000	.1471	.1124	.0672
4	.1250	.1000	.0833	.2222	.0000	.1667	.1429	.0000	.2000	.4000	.0000	.0000	.1238
5	.0000	.0179	.0143	.0370	.0169	.0000	.0313	.0526	.1111	.0000	.0000	.0625	.0240
6	.0000	.0000	.0000	.0000	.0000	.0000	.2500	.0000	.0000	.0000	.3333	.0000	.0435
7	.0247	.0612	.0962	.0426	.0278	.0833	.0811	.0345	.1111	.0000	.0000	.1525	.0667
8	.2000	.0000	.0909	.0000	.3333	.0000	.2222	.1250	.0000	.2500	.0000	.0000	.1035
9	.1061	.1732	.1736	.1944	.1864	.3284	.2478	.2750	.4211	.2353	.2000	.2344	.2023
10	.4000	.2000	.1667	.0000	.1250	.2500	.1000	.5000	.0000	.5000	1.0000	.5000	.2373
11	.1338	.2120	.2238	.2400	.2455	.2511	.2041	.2561	.2927	.2362	.2617	.3341	.2328
12	.1757	.2188	.3171	.2475	.2632	.1757	.3093	.2500	.3103	.4038	.3469	.3478	.2734
13	.0952	.3750	.1951	.1875	.3250	.4063	.3077	.1765	.3333	.2308	.1250	.3333	.2611
14	.0000	.0000	.0000	.0000	.7500	.0000	.3333	.0000	.0000	.3333	.0000	.5714	.2941
15	.2232	.3400	.3564	.3229	.4217	.4464	.5000	.4688	.4328	.3824	.4561	.5000	.4033
16	.1667	.2353	.3077	.2353	.3500	.4000	.4828	.4333	.3103	.4286	.6667	.6500	.3916
17	.0000	.1250	.0000	.0000	.0000	1.0000	.2000	.0000	.0000	.0000	.0000	.2000	.1081
18	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	.1667
19	.0000	.0000	.0000	1.0000	.0000	.0000	.3333	.0000	.0000	.0000	.0000	.5000	.2143
20	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.1000
21	.2581	.1538	.3404	.2308	.2667	.3333	.2778	.2381	.4444	.3200	.3429	.4000	.2946
22	.4444	.4000	.4167	.1538	.4706	.1667	.4667	.4167	.4286	.4167	.2222	.2857	.3716
23	.3333	.6250	.3750	.5263	.5000	.3846	.2000	.6250	.3000	.5556	.3000	.3333	.4452
24	.0000	1.0000	1.0000	.7500	.5556	.0000	.4000	.8000	.4000	.5714	.7143	.5000	.6226
Composite	.1133	.1724	.1879	.1864	.2102	.2237	.2233	.2656	.2924	.2903	.2788	.3240	.2148
Male	.1064	.1671	.1784	.1770	.1945	.2180	.2166	.2452	.2798	.2615	.2725	.3198	.2036
Female	.2857	.2687	.3562	.2947	.3617	.3250	.3034	.4000	.3881	.4103	.3117	.3696	.3424

Table D-32. Reenlistment Rates for Cell 3 (FY 73/TOS 4)

Subpopulation	FY 73 accessions, Four-year term of service: ETS month Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Subpopulation rate
1	.2222	.1600	.1364	.0455	.0667	.3333	.0455	.2143	.0000	.4000	.0000	.0000	.1491
2	.0000	.0000	.0000	.0000	.0000	.0000	.5000	.0000	.0000	.0000	.0000	.0000	.0909
3	.0870	.2500	.1364	.3500	.2800	.3810	.1000	.1250	.1200	.2500	.2581	.1806	.2010
4	1.0000	1.0000	.6667	.2500	.5000	.0000	1.0000	.4000	.0000	.2500	.3750	.1111	.3542
5	.1667	.0000	.0000	.1429	.0000	.0000	.2000	.0000	.0000	.0000	.0000	.0000	.0588
6	.0000	.3333	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.1000
7	.0000	.0000	.2500	.4444	.2500	.1429	.0000	.2857	.3333	.2500	.1818	.1750	.1765
8	1.0000	.0000	.0000	.3333	.0000	1.0000	1.0000	.0000	.2000	.0000	.6000	.5000	.4546
9	.3438	.3125	.2500	.4737	.1667	.2308	.4545	.4000	.3333	.0000	.0000	.2500	.3192
10	.0000	.6667	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.6250
11	.1875	.3421	.4035	.2162	.3659	.3571	.2632	.2162	.3103	.1429	.3571	.2791	.2850
12	.2222	.2500	.2500	.2000	.3333	.3571	.1579	.5556	.1429	.5000	.2500	.6667	.3136
13	.3750	.2000	.3000	.1250	.0000	.2857	.2000	.0000	.6667	.0000	.0000	.5000	.2500
14	.0000	.0000	1.0000	.0000	.0000	.0000	.5000	1.0000	1.0000	.0000	.0000	.0000	.3636
15	.5000	.4167	.4074	.4000	.3750	.1250	.4000	.3333	.2143	.0000	.7143	.3784	.3824
16	1.0000	.2500	.5000	.1667	.0000	.6667	.2500	.5000	.5714	1.0000	.6667	.5000	.4773
17	.0000	.0000	1.0000	.0000	1.0000	.0000	.5000	.0000	.0000	.0000	.5000	.0000	.5000
18	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
19	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
20	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
21	.0000	1.0000	.5000	.2000	.0000	1.0000	.5000	.0000	.0000	.0000	.0000	.0000	.2500
22	.0000	.0000	.0000	1.0000	.0000	1.0000	1.0000	.0000	.0000	.5000	.0000	1.0000	.7500
23	.0000	1.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.3333
24	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
Composite	.2415	.2966	.2919	.2419	.2431	.3103	.2513	.2727	.2353	.2576	.3333	.2463	.2654
Male	.2415	.2906	.2864	.2367	.2429	.3028	.2383	.2773	.2478	.2667	.3333	.2456	.2631
Female	.0000	1.0000	.6667	.3750	.2500	.6667	.6667	.0000	.0000	.1667	.3333	.3333	.3696

Table D-33. Reenlistment Rates for Cell 3 (FY 74/TOS 3)

Subpopulation	FY 74 accessions, Three-year term of service: ETS month Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Subpopulation rate
1	.0784	.0638	.0843	.1491	.1636	.0980	.1349	.1075	.1190	.1250	.0880	.0964	.1108
2	.0000	.0000	.1111	.3333	.0833	.3333	.3333	.1000	.0000	.2308	.0000	.2353	.1468
3	.0941	.1923	.3103	.2740	.2449	.1429	.1736	.2376	.1667	.1429	.1651	.2500	.2059
4	.1429	.2857	.3636	.2667	.3077	.2857	.2778	.2000	.3333	.1622	.4146	.3400	.2920
5	.0625	.0769	.0735	.1154	.2063	.1364	.0392	.1087	.0732	.1053	.1268	.1182	.1071
6	.0000	.0833	.3333	.1818	.1765	.3636	.1875	.1250	.4444	.2727	.1818	.0588	.1946
7	.1429	.2308	.2750	.2778	.0667	.2083	.1707	.3158	.3421	.2813	.2391	.2537	.2425
8	.1667	.2000	.2857	.3333	.4000	.0000	.2000	.1429	.1739	.2778	.3636	.2222	.2434
9	.2807	.2986	.2449	.1910	.2102	.2200	.2839	.2609	.2500	.2195	.2162	.2857	.2461
10	.3333	.3077	.5000	.2857	.3529	.3333	.1429	.2857	.3333	.0000	.6000	.5000	.3305
11	.3750	.2786	.2600	.2386	.2101	.2875	.2527	.2232	.2243	.3396	.2703	.3687	.2838
12	.4211	.4474	.3261	.3409	.4146	.2643	.2857	.2931	.4490	.4750	.3571	.3750	.3794
13	.3913	.3387	.2903	.3467	.4286	.3636	.3061	.3333	.2647	.1364	.7692	.5000	.3581
14	.4286	.5556	.5000	.2667	.3333	.3750	.2727	.2857	.5455	.1111	.3333	.3750	.3958
15	.4891	.5620	.3889	.4133	.3542	.2800	.5000	.3800	.4000	.4783	.6000	.5631	.4661
16	.2632	.4815	.4231	.3333	.3684	.5294	.4286	.5217	.5294	.3846	.6364	.4000	.4333
17	.3333	.4615	.2800	.3333	.2857	.3333	.3824	.2069	.3200	.3333	.3182	.3023	.3166
18	.0000	.7500	.0000	.3750	.3333	.3636	.3529	.3125	.5833	.2000	.4000	.3500	.3475
19	.0000	.0000	.5000	.2500	.2727	.4000	.5000	.6667	.2857	.5000	.6667	.5926	.4748
20	.0000	.5000	1.0000	.5000	.5000	.5000	.4286	.7143	.2222	.8000	.5000	.4000	.5167
21	.2778	.3529	.3108	.2239	.3768	.2581	.2361	.4146	.2424	.2857	.3200	.3371	.3059
22	.1818	.2857	.5500	.2821	.4000	.3333	.4375	.5238	.4615	.1739	.2400	.3667	.3553
23	.8333	.5000	.2308	.4167	.2308	1.0000	.4286	.5789	.8000	.2632	.5000	.6538	.5000
24	.5000	1.0000	.5000	.4545	.9000	.6250	.7500	.7500	.7273	.4444	.8000	.5000	.6263
Composite	.3086	.3012	.2795	.2557	.2719	.2543	.2569	.2743	.2728	.2417	.2566	.3043	.2763
Male	.3067	.2903	.2698	.2471	.2484	.2354	.2353	.2391	.2477	.2230	.2293	.2847	.2593
Female	.3265	.3917	.3419	.3029	.3851	.3765	.3608	.4467	.4083	.3306	.3871	.4040	.3731

Table D-34. Reenlistment Rates for Cell 3 (FY 74/TOS 4)

Subpopulation	FY 74 accessions, Four-year term of service: ETS month Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Subpopulation rate
1	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
2	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
3	.2188	.0526	.0000	.0000	.0000	.0000	.1667	.0000	.0000	.0000	.0000	.0000	.1035
4	.0000	.2500	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0833
5	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
6	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
7	.1429	.3333	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.1052
8	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
9	.0000	1.0000	.0000	.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.6000
10	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
11	.4667	.2353	.3000	.2222	.0769	.2143	.1852	.1034	.0870	.1667	.2857	.0000	.2202
12	.2500	.3636	.4545	.3000	.3333	.2500	.1538	.6667	.0000	.4000	.0000	.0000	.2921
13	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
14	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
15	.3636	.2727	.3333	.4167	.4375	.1667	.0769	.0000	.1667	.2500	.0000	.0000	.2708
16	1.0000	.5714	.0000	.0000	.3333	.0000	.0000	.0000	.5000	.0000	.0000	.0000	.3913
17	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
18	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
19	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
20	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
21	.5000	.4000	.0000	.2500	.0000	.5000	.0000	.0000	.0000	.0000	.0000	.0000	.2778
22	.2500	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.1000
23	.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
24	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
Composite	.3113	.2617	.2800	.2143	.2203	.2143	.1351	.1429	.0909	.1905	.1053	.0000	.2192
Male	.3131	.2626	.2817	.2188	.2241	.2000	.1389	.1548	.0909	.1905	.1053	.0000	.2189
Female	.2857	.2500	.2500	.1667	.0000	.5000	.0000	.0000	.0000	.0000	.0000	.0000	.2258

Table D-35. Reenlistment Rates for Cell 4 (FY 73/TOS 3)

Subpopulation	FY 73 accessions, Three-year term of service: ETS month Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Subpopulation rate
1	.2857	.3889	.2727	.3333	.2857	.5000	.4667	.0000	.0000	.0000	.0000	1.0000	.3258
2	.0000	1.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.7500
3	.4706	.4250	.4000	.4333	.3750	.1333	.4545	.1667	.3077	.7500	.4444	.3571	.3991
4	.5000	.3333	.0000	.2500	.7500	.5000	.3333	.0000	.0000	.0000	.5000	.0000	.3448
5	.5714	.2500	.3000	.5000	.3333	.5000	.0000	1.0000	.0000	.0000	.0000	.0000	.3208
6	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	.2500
7	.5000	.2000	.1538	.3333	.1428	.1667	.1428	.1428	.1667	.6060	.3333	.4286	.2857
8	.4000	.0000	.0000	.5000	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.2353
9	.6122	.6400	.6579	.5405	.5625	.4167	.3043	.4286	.0000	.0000	1.0000	.1111	.5412
10	1.0000	.0000	.8000	.5000	1.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.7778
11	.5787	.4715	.4690	.5684	.4930	.4843	.5484	.5400	.5200	.3571	.2308	.5610	.5159
12	.4333	.5517	.5294	.6087	.4737	.2307	.5556	.1818	.3750	.5000	.3333	.6667	.4790
13	.6842	.9167	.6923	.8000	.5000	.3333	.6250	.3333	.0000	1.0000	.0000	.5000	.6622
14	.0000	1.0000	.6667	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.4615
15	.5733	.6935	.7500	.6333	.5909	.6956	.7000	.6923	.7273	.5000	1.0000	.6923	.6677
16	.6000	.6667	.7500	.7500	.5000	.5000	.6000	.3333	.6667	.0000	.3333	.0000	.6379
17	.3333	.5000	.3333	.0000	1.0000	.0000	.6667	.0000	1.0000	.0000	.0000	.5000	.4348
18	.0000	.0000	.0000	1.0000	.0000	1.0000	.7500	1.0000	.2500	.0000	1.0000	.0000	.6154
19	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	.0000	.2857
20	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.3333
21	.4118	.2105	.4667	.3636	.5000	1.0000	.5454	.8333	.3750	.4000	.0000	.3333	.4286
22	.4000	.7778	.6000	.5000	.6667	.6667	.5000	.0000	.0000	.0000	.0000	.0000	.4667
23	.4000	.8000	.5000	.50000	.5000	1.000	1.0000	.0000	.0000	.0000	.0000	.0000	.6500
24	.0000	.0000	.5000	.0000	.0000	.0000	.5000	.0000	.0000	1.0000	1.0000	.0000	.4444
Composite	.5440	.5221	.5130	.5341	.4826	.4444	.4895	.4297	.4040	.3958	.5000	.4717	.5022
Male	.5525	.5273	.5168	.5423	.4724	.4360	.4787	.4196	.4074	.4444	.4878	.4948	.5061
Female	.4063	.4571	.4643	.4211	.5484	.6250	.5769	.5000	3889	.2500	.6000	.2222	.4602

Table D-36. Reenlistment Rates for Cell 4 (FY 73/TOS 4)

Subpopulation	FY 73 accessions, Four-year term of service: ETS month Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Subpopulation rate
1	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
2	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
3	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
4	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
5	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
6	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
7	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
8	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
9	.4286	.0000	1.0000	.0000	.5000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.2500
10	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
11	.2903	.3636	.2000	.2500	.1429	.5000	.1429	.0000	.2857	.0000	.0000	.0000	.2700
12	.0000	.6667	.3333	.0000	1.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.5000
13	.0000	.0000	.0000	.0000	.0000	.0000	.5000	.0000	.0000	.0000	.0000	.0000	.1667
14	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
15	.8889	.3333	.6667	1.0000	.3333	1.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.6923
16	.0000	.5000	1.0000	.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.6000
17	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
18	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
19	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
20	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
21	.0000	.0000	.0000	.5000	.0000	.0000	.0000	1.0000	.0000	1.0000	.0000	.0000	.6000
22	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
23	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
24	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
Composite	.3387	.2549	.2581	.2632	.2222	.3000	.2308	.2000	.5000	1.0000	.0000	.0000	.2851
Male	.3443	.2653	.2581	.2353	.2222	.3000	.2308	.1111	.5000	.0000	.0000	.0000	.2804
Female	.0000	.0000	.0000	.5000	.0000	.0000	.0000	1.0000	.0000	1.0000	.0000	.0000	.4286

Table D-37. Reenlistment Rates for Cell 4 (FY 74/TOS 3)

Subpopulation	FY 74 accessions, Three-year term of service, ETS month: Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Subpopulation rate
1	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
2	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
3	.2000	.2857	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.1304
4	.0000	.5000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.5000
5	.0000	.2500	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0238
6	.3333	.5000	.0000	.0000	.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.2500
7	.3333	.0000	.0000	.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.2143
8	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.5000
9	.7778	.2500	.4615	.4167	.6000	.5000	.5714	.2500	.0000	.0000	.0000	.0000	.4677
10	.0000	1.0000	1.0000	.0000	.0000	.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.6667
11	.3478	.5333	.5000	.2857	.7143	.3333	.5455	.2857	.4000	.5000	.0000	.0000	.4356
12	.6667	.6364	.0000	.1667	.2857	.2857	.7500	.3333	.0000	.0000	1.0000	.0000	.4259
13	.5000	.5000	.3333	.6000	.0000	.4000	.0000	.3333	.3333	.0000	.0000	.0000	.3889
14	.6667	.0000	.0000	.5000	.3333	1.0000	.0000	.3333	.0000	.0000	.0000	.0000	.4000
15	.6429	.5000	.5000	.2500	.8000	.0000	.5000	1.0000	.0000	.0000	.0000	.0000	.5405
16	1.0000	.0000	.6667	1.0000	.3333	1.0000	1.0000	.0000	.0000	.0000	1.0000	.0000	.7692
17	.0000	.3333	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.2500
18	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
19	1.0000	1.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.6667
20	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
21	.7143	.3333	.0000	.8000	.0000	.0000	.3333	.0000	.0000	.0000	.0000	.0000	.4286
22	.0000	1.0000	.6667	.0000	.2500	.0000	1.0000	.5000	.3333	.5000	.5000	.0000	.4286
23	1.0000	.5000	.5000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.2727
24	.0000	.0000	.0000	.5000	1.0000	.0000	1.0000	.0000	1.0000	1.0000	.0000	.0000	.8571
Composite	.4600	.4146	.3253	.3115	.3333	.3056	.5610	.2647	.2381	.2500	.3333	.0000	.3715
Male	.4432	.4058	.3243	.2745	.3478	.3056	.5429	.2857	.2000	.1111	.3333	.0000	.3611
Female	.5833	.4615	.3333	.5000	.2500	.0000	.6667	.1667	.3333	.6667	.3333	.0000	.4342

APPENDIX E

RESULTS FROM STATISTICAL ANALYSIS OF THE EFFECTS OF EXOGENOUS VARIABLES ON REENLISTMENTS

E-1. BACKGROUND. The purpose of this appendix is two-fold. It describes the data sources for the exogenous variables used in the analysis, and it presents the detailed results of analysis of the relationship between these exogenous variables and the reenlistment rates. Exogenous variables as used in this study refer to those factors, external to Army controls, which are hypothesized as influences to the reenlistment environment.

E-2. VARIABLES. The specific variables chosen for analysis were the Consumer Price Index (CPI), unemployment rate, and the ratio of military pay to civilian pay (MP/CP). Unemployment rates and monthly changes in the CPI were used to reflect the state of the economy while the MP/CP was chosen as a measure of relative earnings. The MP/CP contrasts average military earnings to that of nonagricultural and nonsupervisory personnel in the national labor force. Military weekly earning were derived by calculating the average pay grade for the study data base and computing the appropriate wage for that grade. The wages were obtained from past Army Force Planning Cost Handbook[4] (AFPCH) reports, Section II, Per Capita Factors. Civilian wages were extracted from appropriate issues of Employment and Earnings[1] as published by US Department of Labor, Bureau of Labor Statistics. The monthly deviations in the CPI were derived from data published in issues of Business Conditions Digest,[3] US Department of Commerce, Bureau of Economic Analysis. The source of unemployment data was Bureau of Labor Statistics (BLS) monthly reports - Table 3A.[2] These reports are unpublished but are available from microfiche records at BLS. The reports contain unadjusted employment data for the civilian noninstitutional labor force by age, sex, and racial categories.

E-3. RESULTS. The results of the correlation analysis are shown in Table E-1 for three-year term of service soldiers and in Table E-2 for four-year TOS soldiers.

Table E-1. Correlations of Reenlistments with CPI, Unemployment Rate and the Ratio of Military Pay to Civilian Pay with Lags of Zero to Six Months for Three-year Term of Service

Demographic variables	Pay	Grades E1 - E3								Grades E4 - E6							
	Race	White				Nonwhite				White				Nonwhite			
	Education	NHSG		HSG		NHSG		HSG		NHSG		HSG		NHSG		HSG	
	Age	Young	Old	Young	Old	Young	Old	Young	Old	Young	Old	Young	Old	Young	Old	Young	Old
Exogenous variables	CPI:																
	No lag	.07	-.08	.18	-.39	.15	.44	.09	.67	.15	.21	.14	.09	.26	.47	.13	.30
	1 month lag	-.08	.52	.19	-.19	.04	.20	-.15	.41	.22	.17	.13	.13	.15	.27	.08	.14
	2 month lag	.08	.53	-.14	-.22	-.24	-.20	-.06	.19	.34	.12	.25	.19	.15	.47	.18	.26
	3 month lag	.11	.11	-.01	-.07	.16	-.08	-.33	.26	.11	.20	.08	.09	.06	.23	.03	.05
	4 month lag	.35	-.28	.05	-.12	.07	.10	-.34	.07	.34	.34	.39	.40	.25	.25	.32	.36
	5 month lag	-.08	.02	-.06	.17	.24	-.06	.24	.04	.14	.15	.23	.21	.16	.18	.23	.06
	6 month lag	-.07	-.26	.02	.33	-.13	.33	.14	.03	-.20	-.37	-.14	-.22	-.22	-.31	-.17	-.27
	Unemployment:																
	No lag	.08	-.05	-.12	.16	-.12	.29	.14	.15	-.18	-.57	-.11	-.55	.47	.08	.42	.11
	1 month lag	.15	.08	-.18	-.14	.17	-.05	-.21	.00	-.57	-.49	-.51	-.46	.35	.07	.28	-.12
	2 month lag	.31	-.19	-.40	-.41	.14	.45	.17	.33	-.40	-.40	-.34	-.31	.29	.02	.31	-.19
	3 month lag	.10	-.32	-.15	-.33	-.14	.13	.14	.45	-.07	-.22	-.03	-.02	.49	.21	.49	-.06
	4 month lag	-.04	-.37	-.30	-.08	.29	.21	.20	.32	.13	-.15	.20	.21	.37	.06	.35	.09
	5 month lag	-.33	-.43	-.06	-.04	.39	-.10	-.13	-.12	-.13	-.32	.21	-.04	.24	-.19	.04	-.18
	6 month lag	.22	-.36	.08	-.09	.03	-.36	-.08	-.18	.02	-.52	.08	-.35	.02	-.28	.08	.01
	MC/CP ratio:																
	No lag	.04	-.27	-.24	.48	.47	.01	.08	-.02	.07	.22	.05	.15	.12	.22	.15	.17
	1 month lag	.15	-.20	-.15	-.08	.12	.26	.10	.24	.19	.30	.17	.31	.22	.29	.28	.25
	2 month lag	.04	-.04	-.21	-.32	-.17	.11	.30	.09	.29	.39	.31	.45	.35	.30	.41	.35
	3 month lag	.26	.08	-.22	-.45	-.37	.42	.17	.33	.36	.40	.32	.41	.39	.27	.37	.38
	4 month lag	.17	.09	-.06	-.46	-.31	.07	-.20	.46	.35	.46	.32	.49	.40	.24	.33	.38
	5 month lag	.11	.01	-.42	-.29	-.03	-.18	-.12	-.04	.59	.50	.58	.63	.68	.44	.61	.52
	6 month lag	-.17	.32	-.17	-.42	-.07	.13	-.00	.38	.32	.40	.32	.34	.37	.37	.43	.34

Table E-2. Correlations of Reenlistments with CPI, Unemployment Rate and the Ratio of Military Pay to Civilian Pay with Lags of Zero to Six Months for Four-year Term of Service

Demographic variables	Pay	Grades E1 - E3								Grades E4 - E6							
	Race	White				Nonwhite				White				Nonwhite			
	Education	NHSG		HSG		NHSG		HSG		NHSG		HSG		NHSG		HSG	
	Age	Young	Old	Young	Old	Young	Old*	Young	Old	Young	Old	Young	Old	Young	Old	Young	Old
Exogenous variables	CPI:																
	No lag	-.16	.11	-.01	.01	-.10		-.07	.03	.11	-.02	-.01	-.01	.10	.39	.15	.16
	1 month lag	-.36	-.25	-.22	-.08	-.08		-.21	-.16	.33	.04	.10	.07	.21	.20	.27	.26
	2 month lag	-.21	-.32	-.30	-.14	.01		-.33	-.35	.32	.20	.35	.25	.44	-.10	.44	.39
	3 month lag	-.29	-.28	-.35	-.36	-.16		-.38	-.40	.45	-.25	.46	.36	.39	-.17	.49	.51
	4 month lag	-.33	-.15	-.35	-.35	-.04		-.27	-.27	.59	-.35	.64	.68	.54	-.28	.61	.66
	5 month lag	-.17	-.01	-.25	-.27	-.20		-.08	-.18	.31	-.35	.75	.73	.41	-.24	.68	.51
	6 month lag	-.07	-.01	-.03	-.11	-.08		.16	-.14	-.27	-.30	.39	.52	.32	-.05	.32	.26
	Unemployment:																
	No lag	-.03	.39	-.20	-.23	.09		.06	-.07	.09	.42	-.24	-.45	.20	-.26	.28	.33
	1 month lag	-.26	.14	-.27	-.17	-.14		-.05	-.08	-.08	.21	-.24	-.32	.24	.19	.24	.48
	2 month lag	-.16	.06	-.49	-.31	.21		-.10	.02	-.02	.18	-.10	-.12	.34	-.00	.34	.19
	3 month lag	-.33	-.02	-.64	-.51	-.01		-.05	.10	.40	-.07	.14	.12	.21	-.06	.51	.10
	4 month lag	-.48	-.00	-.54	-.73	-.12		.12	.27	.50	-.16	.20	.37	.29	-.18	.52	.18
	5 month lag	-.15	-.01	-.45	-.70	-.20		.28	.23	.28	-.20	.49	.54	.14	-.66	.28	-.02
	6 month lag	-.13	.08	-.53	-.57	.15		.32	.33	.43	-.11	.59	.67	.01	-.36	.12	.36
	MP/CP Ratio:																
	No lag	.36	.32	.56	.54	.33		.42	.43	-.19	.46	-.52	-.54	-.29	.15	-.50	-.44
	1 month lag	.27	.06	.40	.21	.06		.26	.27	.01	.03	-.29	-.41	-.18	.00	-.34	-.20
	2 month lag	.01	-.03	.06	.16	.18		.03	.00	.23	.20	.00	-.12	.09	.11	.08	.25
	3 month lag	-.12	.06	-.13	-.01	.18		-.17	-.17	.26	.24	.28	.24	.29	.19	.40	.44
	4 month lag	-.46	-.45	-.26	-.17	-.27		-.33	-.27	.36	-.37	.38	.39	.34	.11	.48	.49
	5 month lag	-.51	-.27	-.35	-.17	-.26		-.34	-.37	.50	-.21	.55	.53	.35	-.20	.66	.51
	6 month lag	-.33	-.22	-.31	-.24	-.27		-.28	-.35	.12	-.35	.50	.52	.37	-.16	.55	.37

*No reenlistments occurred for this subpopulation

APPENDIX F

RESULTS OF AID III ANALYSIS

F-1. BACKGROUND. This appendix presents the results of using the AID III Model to select from a variety of candidates those demographic variables which provide the best explanation of reenlistment behavior for the FY 73 and FY 74 accession cohort files. The variables selected by the AID III Model were age, education, race, term or service, sex and pay grade. Prior to using the model, the 1-RPM data base was stratified according to the Selected Reenlistment Bonus (SRB) level that a soldier was paid or that he was eligible for at the time of separation. The data were stratified to insure that the SRB was treated as a reenlistment inducement which acts on a subpopulation rather than as a factor which determines the subpopulation definition. Each of the stratified subsets were input to the AID Model according to a problem definition deck which revised the input data to conform to AID requirements. The use of the AID Model is shown in Figure F-1.

F-2. VARIABLES. Table F-1 shows the variables and the variable classes used as inputs to the AID Model. Table F-2 defines the study subpopulations in terms of the selected variables and variable classes.

F-3. RESULTS. Figure F-2 provides an example of the symbology used in Figures F-3 through F-9. In Figure F-2, population 1 consisting of 6400 soldiers with a reenlistment rate of 0.21 is subdivided based on pay grade into populations 2 and 3; population 2 has 1400 soldiers in pay grades E1-E3 who have reenlisted at the rate of 0.08. Population 3 has 5000 soldiers in pay grades E4-E6 who have reenlisted at a rate of 0.30. Figures F-3 through F-9 are interpreted in the same manner. An analysis of the AID trees shows that the same set of variables was identified by AID across the different SRB levels although not always in the same order. The order of identification of the variables is not significant for this study; the identification of the variables to be used in defining the subpopulations was the purpose of the AID analysis.

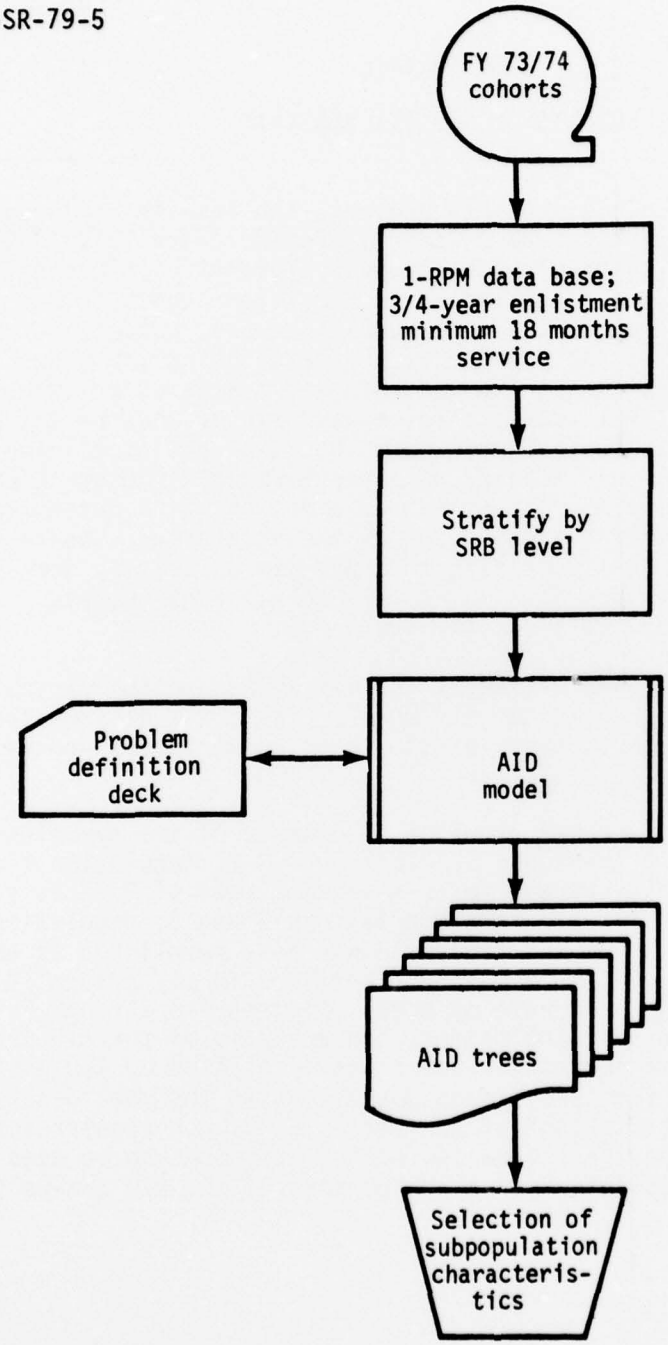

Figure F-1. Example of an AID III Model Set-up and Execution

Table F-1. AID Variable Classes

Variable	Class	Class definition
Mental category	1	93-99
	2	65-92
	3	31-64
	4	16-30
Age	1	16-20
	2	21 or older
Education	1	More than high school
	2	High school graduate
	3	GED
	4	Non-high school graduate
Term of service	2-4	Years of service
Race	1	White
	2	Black
	3	Other
Sex	1	Male
	2	Female
Pay grade	1-6	E1 - E6

Table F-2. 1-RPM Subpopulation Codes

Subpopulation	Sex	Pay grade	Race	Education	Age
1	Male	E1-E3	White	NHSG	Y
2					0
3				HSG	Y
4					0
5			Nonwhite	NHSG	Y
6					0
7				HSG	Y
8					0
9		≥ E4	White	NHSG	Y
10					0
11				HSG	Y
12					0
13			Nonwhite	NHSG	Y
14					0
15				HSG	Y
16					0
17	Female	E1-E3	White	HSG	Y
18					0
19			Nonwhite		Y
20					0
21		≥ E4	White		Y
22					0
23			Nonwhite		Y
24					0

Codes: NHSG - Non-high school graduate
HSG - High school graduate
Y - Young, less than or equal to 20 years of age
O - Old, more than 20 years of age

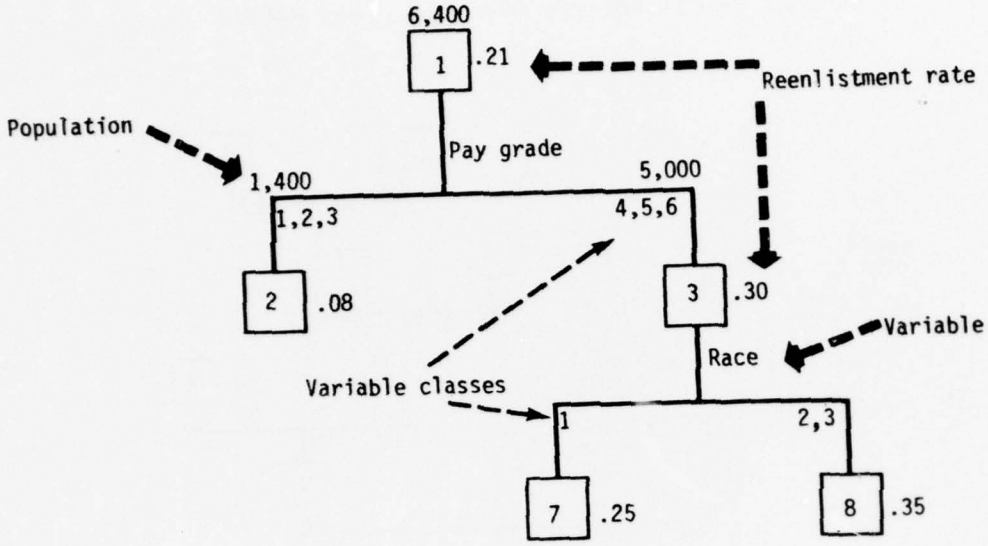

Figure F-2. AID Symbols

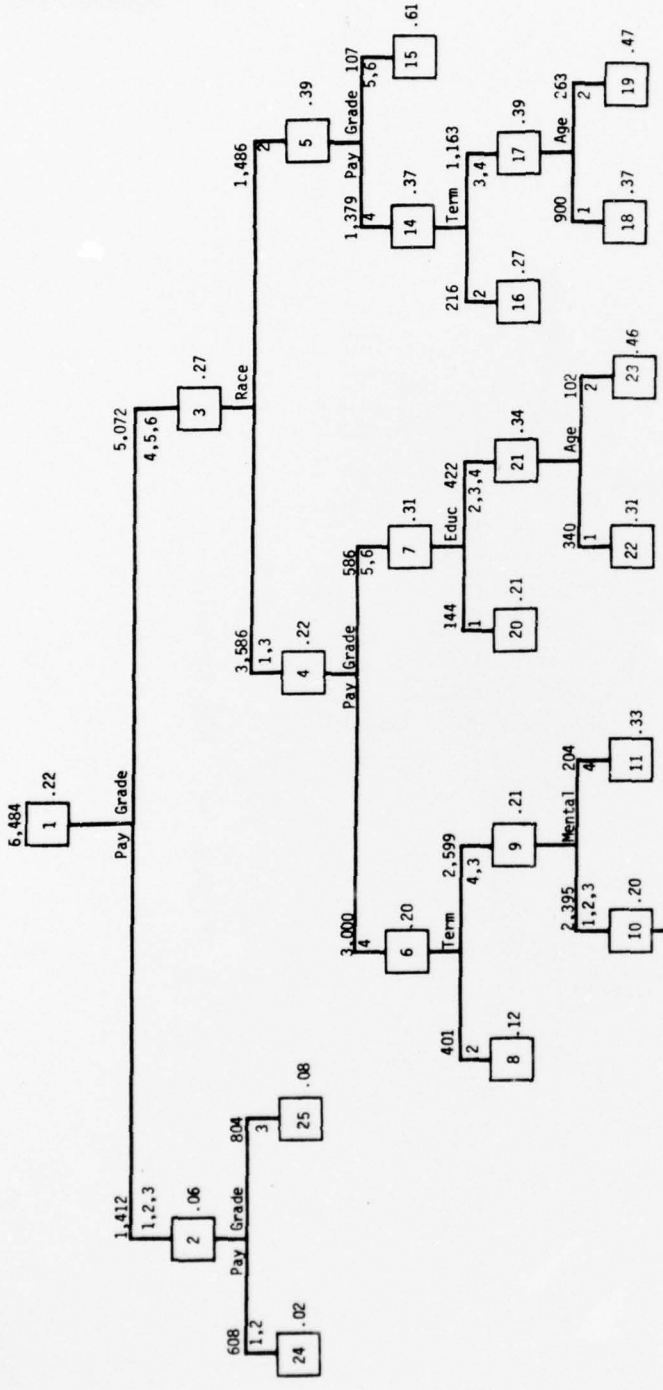

Figure F-3. AID Tree for SRB OA (no bonus)

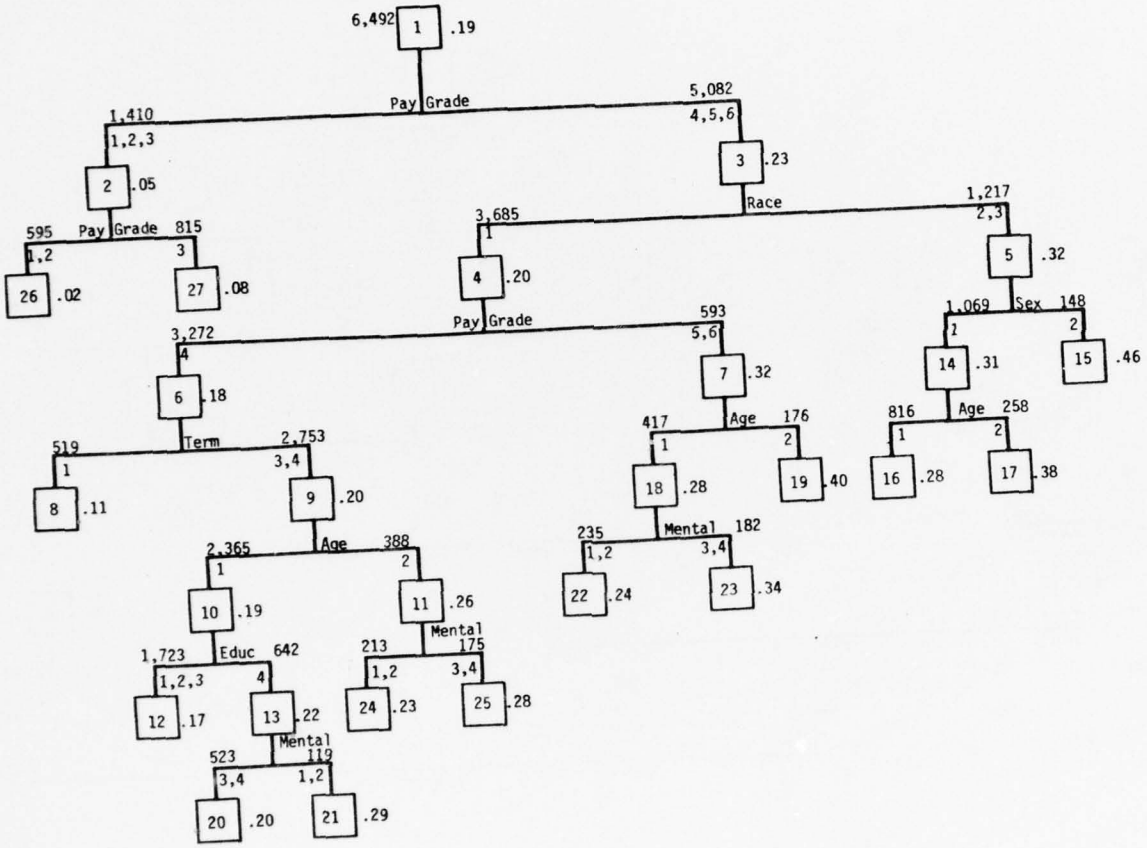

Figure F-4. AID Tree for SRB OB (no bonus)

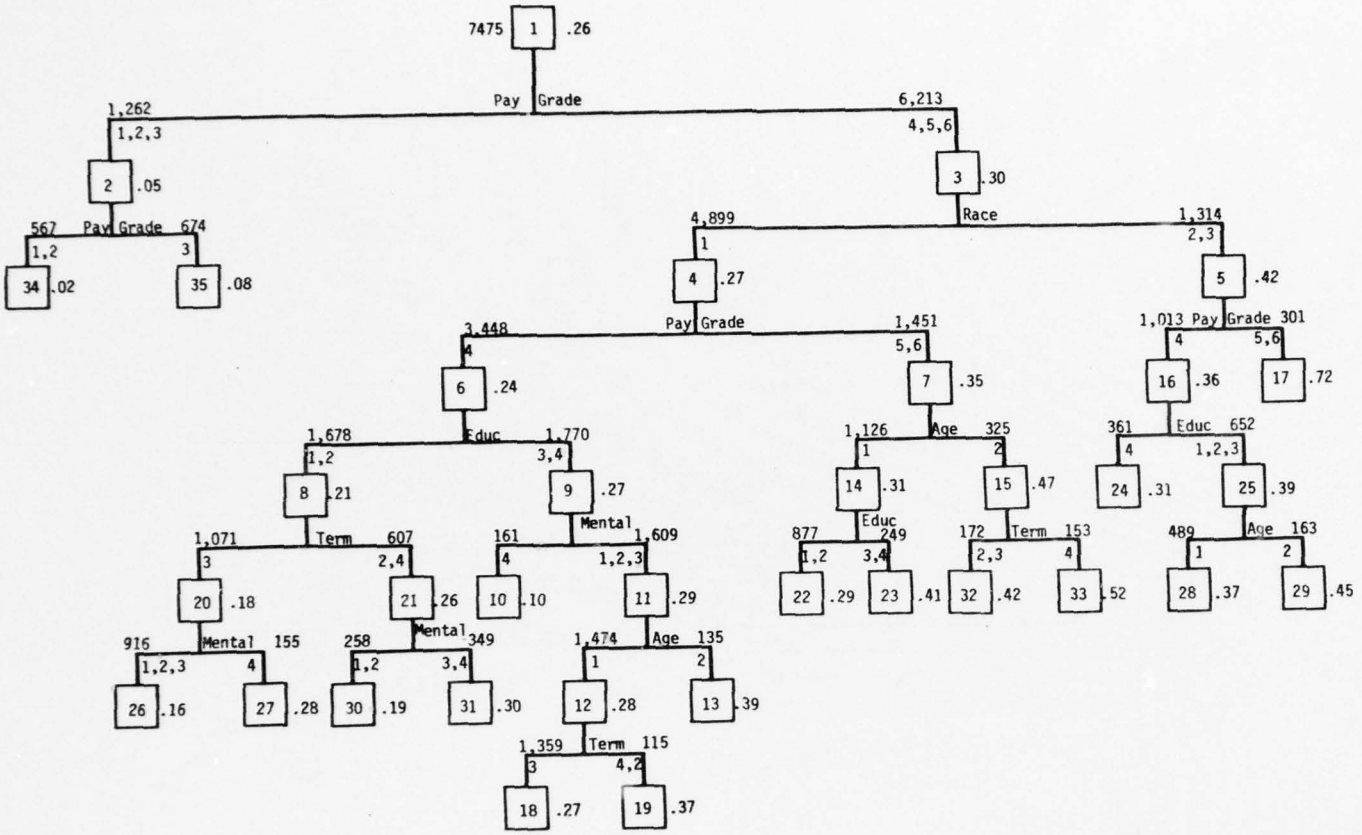

Figure F-5. AID Tree for SRB 1

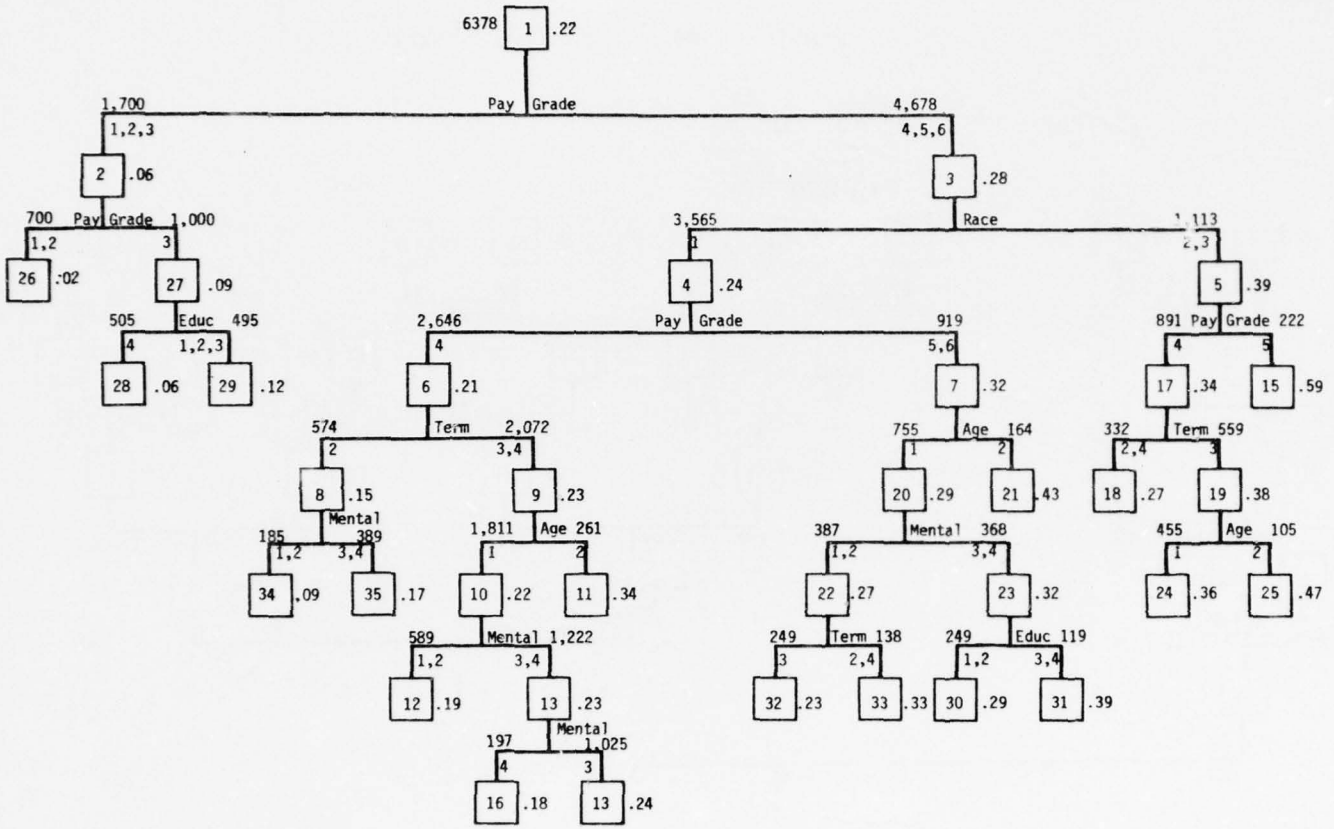

Figure F-6. AID Tree for SRB 2

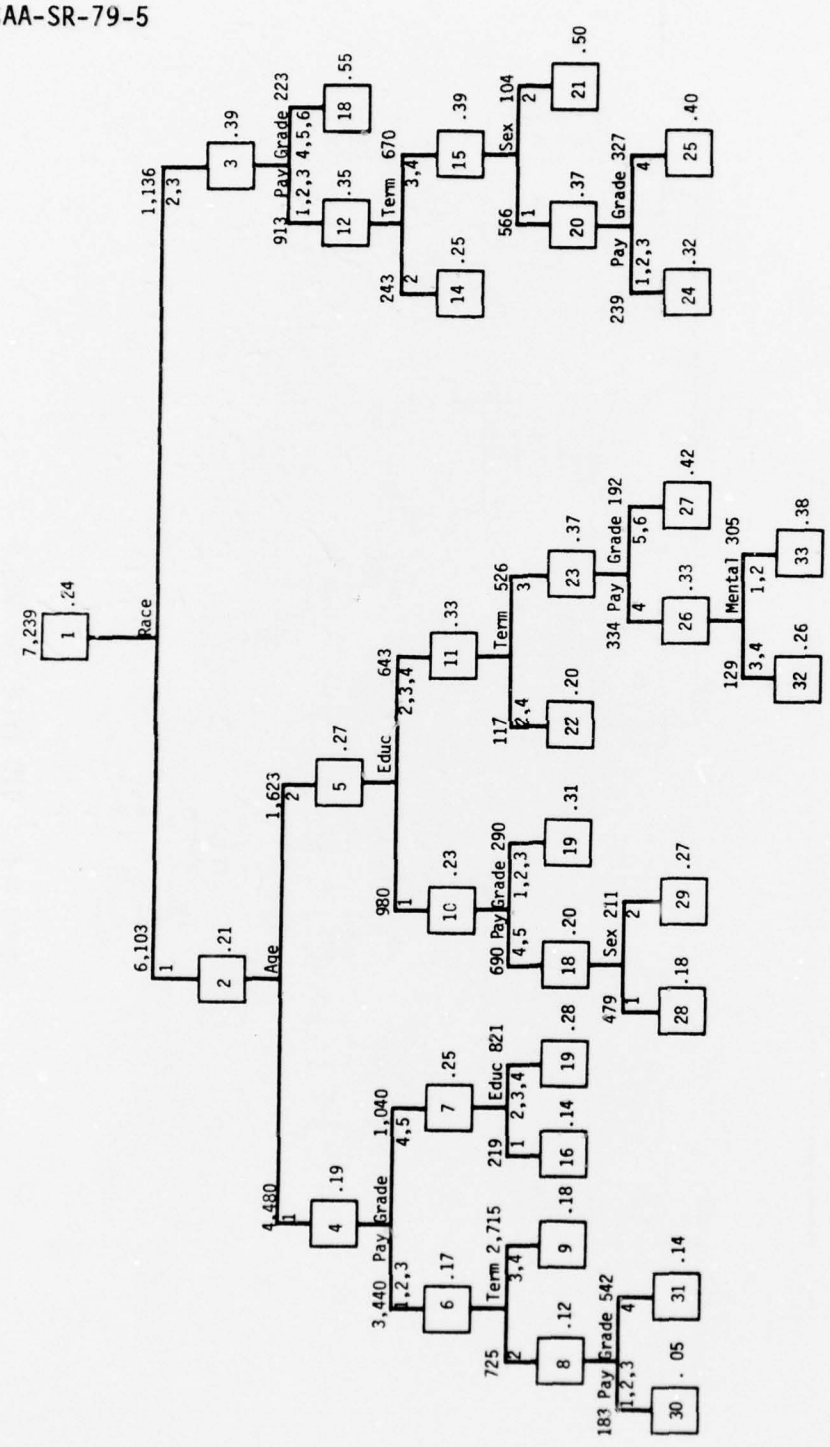

Figure F-7. AID Tree for SRB 3

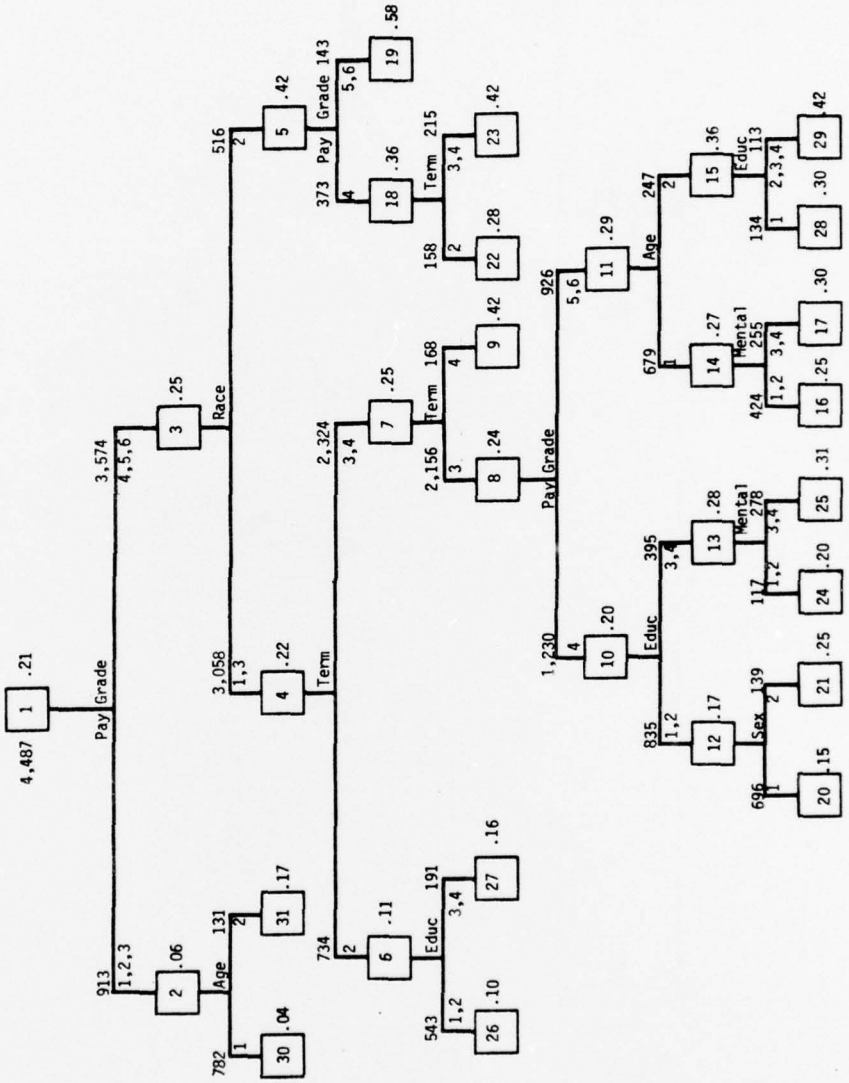

Figure F-8. AID Tree for SRB 4

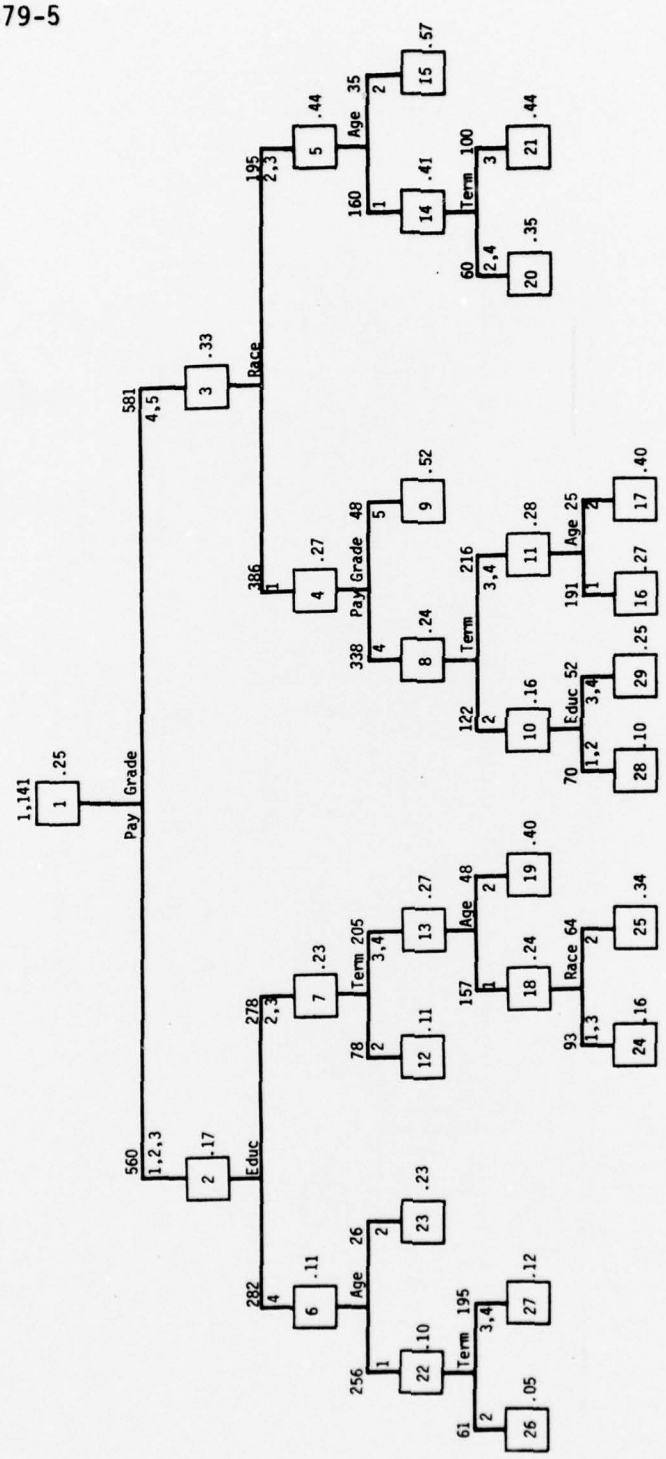

Figure F-9. AID Tree for SRB 5

APPENDIX G

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